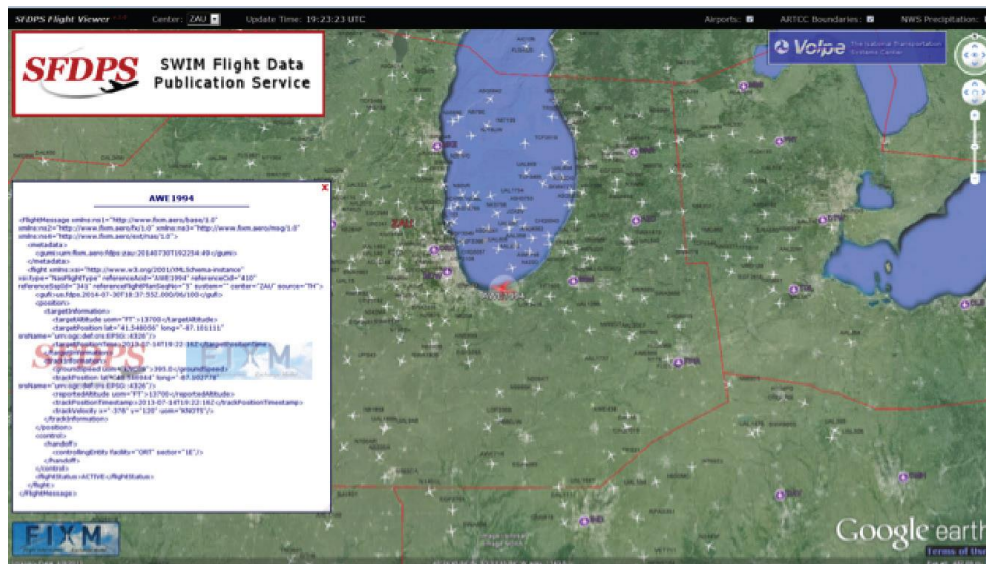


SWIM Flight Data Publication Service (SFDPS)

Data Consumer Reference Manual

Version 2.1.4

December 26, 2017



Chicago Center (ZAU) Flight Data (FIXM format)

Prepared by:
John A. Volpe National Transportation Systems Center (Volpe Center)
Air Traffic Management Systems Division
55 Broadway
Cambridge, Massachusetts 02142

Table of Contents

1. Introduction	5
2. Messages Published by SFDPS	8
2.1 Flight Data Messages.....	9
2.2 Airspace Data Messages	12
2.3 Operational Data Messages	12
2.4 General Messages	14
2.5 Reconstitution Messages.....	14
2.6 Batched Track Messages	15
2.7 SFDPS Derived Messages.....	15
3. SFDPS Message Properties and Header	17
3.1 JMS Properties.....	17
3.2 SFDPS Header	19
4. SFDPS Message Body Content and Structure	24
4.1 Flight Data Messages Details.....	24
4.2 Airspace Data Messages Details.....	92
4.3 Operational Data Messages Details.....	98
4.4 General Messages Details	108
4.5 Reconstitution Messages Details.....	114
4.6 SFDPS Derived Messages Details.....	139
5. Helpful Hints	146
5.1 GUFH Handling.....	146
5.2 Message sequencing	146
5.3 Ambiguous FIXM entries	146
6. SFDPS Connect Application and Development.....	150
6.1 Software Requirements.....	150
6.2 Installation.....	151
6.3 Project Environment.....	152
6.4 Development	154
6.5 Building the SFDPS Connect Application	155
6.6 Creating the SFDPS Connect Installation Package.....	159
6.7 Running the SFDPS Connect Application.....	160

Appendix A: Acronyms	162
Appendix B: Mapping to FIXM Schema	163
FDPS Message	163
Flight Plan [FH], Flight Amendment [AH], Flight Update [HU]	163
Converted Route Information [HX]	170
Cancellation Information [CL]	170
Departure Information [DH].....	171
Aircraft Identification Amendment Information [IH]	171
Hold Information [HH].....	172
Progress Report Information [PH]	172
Flight Arrival Information [HV]	173
Expected Departure Time Information [ET]	173
Position Update Information [HP].....	173
Tentative Flight Plan Information [NP].....	174
Tentative Aircraft Identification Amendment Information [NI].....	175
Tentative Flight Plan Removal [NL]	176
Tentative Flight Plan Amendment Information [NU]	176
Track Information [TH]	178
Drop Track Information [RH]	179
Interim Altitude Information [LH]	179
ARTS Flow Control Track/Full Data Block Information [HZ]	180
Beacon Code Reassignment [BA]	181
Beacon Code Restricted [RE]	181
FDB Fourth Line Information [HF]	182
Point Out Information [HT]	182
Inbound Point Out Information [PT]	183
Handoff Status [OH]	183
RReply.....	184
Reconstitution Flight Message – DBRTFPI.....	185
Appendix C: Mapping to AIXM Schema.....	193
Route Status Information (HR)	193

Adapted Route Status Reconstitution (DBRTRI).....	193
Sector Assignment Status Information (SH).....	193
Sector Assignment Reconstitution (DBRTSI)	195
Special Activities Airspace (SAA) Information (SU)	195
Appendix D: SFDPS Connect Development Environment Details	197
Software Packages.....	197
Source Code.....	198
Referenced Libraries (JAR files)	201
Configuration Properties Files	202
Simple Schema XML Related Files	202
Run Scripts.....	203
Appendix E: SFDPS Connect Properties Description	204
JMS Client Properties	204
Processor Properties	205
GUI Properties	207
SOAP Web Services Request Properties.....	208
Appendix F: Summary of SFDPS Connect Executable Modes	213

1. Introduction

System-Wide Information Management (SWIM) Flight Data Publication Service (SFDPS) is the NextGen solution for distributing En Route ATC information generated by En Route Automation Modernization (ERAM). SFDPS distributes the following types of data:

1. **Flight Data** – Data specific to an individual flight.
2. **Airspace Data** – Airspace data that is of general interest.
3. **Operational Data** – Data supporting specific FAA monitoring functions.
4. **General Message** – General, free-form text messages to one or more NAS users or classes of NAS users.

The SFDPS data is distributed to consumers through the SWIM NEMS communications network. The data is sent via JMS messages. A consumer application must connect to the NEMS system, and subscribe to receive the SFDPS data. The data can be accessed through two services:

1. **Publish-Subscribe** - The SFDPS Publish-Subscribe service provides unified, streaming flight data to authorized consumers through the SWIM NEMS infrastructure via JMS messages.
2. **Request-Response** - The user can submit data requests to SFDPS based on user defined filtering criteria. The requested data is sent to the consumer through the SWIM NEMS via JMS messages.

This document provides details on data distributed by SFDPS. It describes the type of messages supported by SFDPS including the structure and content of the messages, message properties, and header information.

This document also describes the SFDPS Connect which is a SFDPS consumer application developed as a way to demonstrate how to connect to, request, and receive SFDPS data. The document provides details intended to assist developers who may want to develop their own consumer application.

This document consists of the following chapters:

[Introduction](#) - current section.

[Messages Published by SFDPS](#) – provides information for all messages published by SFDPS.

[SFDPS Message Properties and Header](#) - describes JMS Properties and the SFDPS Header associated with SFDPS messages.

[Chapter 4 - SFDPS Message Body Content and Structure](#) - defines data fields within all messages provided by SFDPS.

[Chapter 5 - Helpful Hints](#) – provides miscellaneous additional useful information.

[SFDPS Connect Application and Development](#) – describes the SFDPS Connect application and provides development information.

[**Appendix A: Acronyms**](#) – describes common acronyms associated with the SFDPS project.

[**Appendix B: Mapping to FIXM Schema**](#) – contains mapping between SFDPS Simple Schema XML and FIXM standard.

[**Appendix C: Mapping to AIXM Schema**](#) – contains mapping between SFDPS Simple Schema XML and AIXM standard.

[Appendix D: SFDPS Connect Development Environment](#) Details – contains details of the SFDPS Connect development environment.

[Appendix E: SFDPS Connect Properties Description](#) – lists SFDPS Connect configuration properties.

[Appendix F: Summary of SFDPS Connect Executable Modes](#) – provides a summary of SFDPS Connect application executable modes.

2. Messages Published by SFDPS

This chapter describes the messages available via the four SFDPS En Route Data Publication services, reconstitution messages received from HADDs and messages derived by SFDPS.

Data from SFDPS exists in three different formats:

1. **Simple Schema XML 1.3.8** – SFDPS defined XML format proprietary to the SFDPS system. This format is recommended for data not covered by currently used versions of FIXM and AIXM. This data is available through both Publish-Subscribe and Request-Response services.
2. **FIXM Core 3.0 (with FIXM US Extension 3.0)** – Flight Information Exchange Model, SWIM XML standard format for flight data exchange. This data is available through both Publish-Subscribe and Request-Response services.
3. **AIXM 5.1 (with Annotations SFDPS 1.0)** – Aeronautical Information Exchange Model, SWIM XML standard format for airspace data exchange. This data is only available through the Publish-Subscribe service.

Data Format	Data Availability	
	Publish-Subscribe Service	Request-Response Service
Simple Schema XML	x	x
FIXM	x	x
AIXM	x	

The following table shows the data type association with each of three published data formats.

Data Type	Data Formats		
	Simple Schema XML	FIXM	AIXM
Flight Data	x	x	
Airspace Data	x		x
Operational Data	x		
General Messages	x		
Reconstitution: DBRTSI	x		
Reconstitution: DBRTAI	x		
Reconstitution: DBRTRI	x		
Reconstitution: DBRTFPI	x	x	
SFDPS Derived: RReply	x	x	
SFDPS Derived: Status	x		

Note:

A large number of message descriptions in this chapter were excerpted from: *Interface Control Document, NAS-IC-82422412-01, REVISION B, En Route Automation Modernization (ERAM)/User Systems via Air Traffic Management (ATM) Intermediate Point of Presence (IPOP), April 30, 2012, Federal Aviation Administration, U.S. Department of Transportation*

2.1 Flight Data Messages

The Flight Data includes information such as proposed and active flight plans, track data associated with active flights, arrival and departure data, over-flight data and flight strip and auxiliary flight data, including runway assignments.

Due to safety issues introduced by the availability of beacon code data in messages related to flights that are not yet active, as of SFDPS Release 1.3.1, two versions of some flight messages are generated and appropriately tagged with a new property (FDPS_Restricted) to indicate to NEMS whether the messages can be shared with consumers not explicitly authorized to receive this data. Messages containing beacon code data for pre-departure flights are only shared with consumers explicitly authorized to receive this data. Non-authorized consumers receive the version of the messages from which beacon code data has been removed. Messages containing no beacon code data or messages containing beacon code data but pertaining to active flights are shared without restriction. All flight data messages are tagged appropriately with this new property for NEMS routing.

Message types for which two versions of the message are generated for non-active flights include: FH/FH_FIXM, AH/AH_FIXM, HU/HU_FIXM, NP/NP_FIXM, NU/NU_FIXM, and DBRTFPI/DBRTFPI_FIXM.

For messages of message type BA/BA_FIXM and RE/RE_FIXM, to do with beacon code reassignment and restriction, two versions are not generated for non-active flights, but instead, the one version is tagged with the appropriate value of FDPS_Restricted so that NEMS only shares them with consumers authorized to receive this data. This is because the intent of these messages is to convey changes and restrictions to beacon code data, and removing the beacon code data would render these messages useless.

SFDPS publishes flight data in two formats: Simple Schema XML and FIXM.

The following table shows all Flight Data messages available via SFDPS.

Code	Name	Description
FH	Flight Plan Information	The Flight Plan Information message contains flight plan data for proposed and active flights. It is sent when an ERAM at an ARTCC first creates a new flight record for a flight. Multiple ARTCCs can send copies of the same flight plan. A single ARTCC may have multiple flight plans for one flight, although only one is ever active.
AH	Flight Amendment Information	The Flight Amendment Information message resends all data/fields in the Flight Plan Information message when a change has been made to one or more of the fields on a Flight Plan Information message already sent by ERAM.
HX	Converted Route Information	The Converted Route Information message provides the fixes along the converted route and the calculated time of arrival at each fix, as computed by ERAM. It is re-sent whenever an FH or AH is sent. It is also sent whenever route conversion takes place for a flight or fix time calculations change by more than a certain parameterized value.

Code	Name	Description
CL	Cancellation Information	The Cancellation Information message is sent when a flight plan record is canceled within a particular ARTCC's ERAM. This means that no more data will be sent from that center for that flight plan.
DH	Departure Information	The Departure Information message provides departure related data for a flight. If the status of flight was proposed, the DH indicates that the flight is now active.
IH	Aircraft Identification Amendment Information	The Aircraft Identifier Amendment Information message indicates a change to the flight identification field (flightId_02a) or to the assignment of computer identification (computerId_02d) for a flight.
HH	Hold Information	The Hold Information message indicates a hold of a definite duration, an indefinite hold, or a hold release for a specified flight.
PH	Progress Report Information	The Progress Report Information message updates the position for an active flight, or the release from a prior hold status.
HV	Flight Arrival Information	The Flight Arrival Information message provides arrival data from ERAM for any arriving flight.
HU	Flight Plan Update Information	The Flight Plan Update Information message provides the latest flight plan data on an active flight when a new ARTCC assumes control of that flight.
ET	Expected Departure Time Information	The Expected Departure Time Information message provides Estimated Departure Clearance Time (EDCT) information, the assigned departure time for a proposed flight whose destination is a controlled airport with a ground delay in effect. It is also used to cancel a previously issued EDCT. The original source of this data is TFMS.
HP	Position Update Information	The Position Update Information message updates the coordination time of an active flight whenever the present position fix time is updated.
NP	Tentative Flight Plan Information	The Tentative Flight Plan Information message is sent when an Air Traffic Controller creates a temporary, partial set of flight plan data and associates it with a flight. A tentative flight plan may later be either canceled or merged with a real flight plan (FH). An NP can be issued only for an active flight.
NI	Tentative Aircraft Identification Amendment Information	The Tentative Aircraft Identifier Amendment Information message indicates a change to the flight identification field (flightId_02a) of a tentative flight plan.

Code	Name	Description
NL	Tentative Flight Plan Removal	The Tentative Flight Plan Removal Information message is sent whenever a tentative flight plan has been deleted or merged with a normal flight plan.
NU	Tentative Flight Plan Amendment Information	The Tentative Flight Amendment Information message updates tentative flight plan data.
TH	Track Information	The Track Information message provides track data or target information, such as aircraft track or target position, altitude, and speed. It is normally sent every 12 seconds for an active flight while the flight is in an ARTCC's airspace.
RH	Drop Track Information	The Drop Track Information message indicates that an ARTCC has discontinued tracking of a particular flight.
LH	Interim Altitude Information	The Interim Altitude Information message provides interim altitude data for a flight.
HZ	ARTS Flow Control Track/Full Data Block Information	The ARTS TZ Flow Control Track/Full Data Block Information message provides a position update from an Automated Radar Terminal System (ARTS).
BA	Beacon Code Reassignment	The Beacon Code Reassignment Information message provides an updated beacon code for a flight plan when ERAM determines that an automatic beacon code reassignment occurred because the requested beacon code was already in use by another aircraft. As of SFDPS Release 1.3.1, when this message pertains to a flight that is not yet active (i.e., that has not yet departed), the message is restricted to users authorized to receive this information.
RE	Beacon Code Restricted	The Beacon Code Restricted Information message provides an updated beacon code for a flight when ERAM determines that a beacon code reassignment occurred because the requested beacon code is adapted as restricted. As of SFDPS Release 1.3.1, when this message pertains to a flight that is not yet active (i.e., that has not yet departed), the message is restricted to users authorized to receive this information.
HF	FDB Fourth Line Information	The FDB Fourth Line Information message provides the displayable, user-specified FDB fourth line data stored in ERAM whenever an ERAM action changes or deletes the fourth line data.
HT	Point Out Information	The Point Out Information message provides inter-facility and intra-facility point out information when these point out actions occur.
PT	Inbound Point Out Information	The Inbound Point Out Information message is sent by ERAM upon receipt of an inter-facility point out message from another center.

Code	Name	Description
OH	Handoff Status	The Handoff Status Information message is sent when a handoff from one ARTCC to another is initiated, accepted, or retracted; when a handoff is taken away; or when the failure of a handoff is detected.

For details of Flight Data messages content refer to [Section 4.1 Flight Data Message Details](#).

2.2 Airspace Data Messages

The Airspace Data provide a combined view of airspace information that contains temporal as well as static information of sector definitions that do not change frequently. It also provides consumers with facility sectorization assignments and updates within En Route domains. Adapted arrival and departure route status is also available. Airspace data includes information such as the status of a sector, including sector configuration data, route status, Special Activity Airspace (SAA) status and altimeter settings.

SFDPS publishes airspace data in two formats: Simple Schema XML and AIXM.

The following table shows all Airspace messages available via SFDPS.

Code	Name	Description
SH	Sector Assignment Status	A Sector Assignment Status message is used to communicate current sector and TRACON configurations.
HR	Route Status	A Route Status message indicates whether adapted departure and arrival routes are active or not. ERAM generates an HR when an assignment at a center changes, or when reconstituting data. A single HR contains only route assignments for one center, and can include one or more routes.
SU	Special Activities Airspace (SAA)	The Special Activities Airspace message provides the status and schedules for a Special Activities Airspace (SAA).
HA	Altimeter Setting	An Altimeter-Setting message is used to communicate altimeter reference data for a particular station, generally an airport.

For details of Airspace Data messages content refer to [Section 4.2 Airspace Data Message Details](#).

2.3 Operational Data Messages

The Operational Data provide: sign-in/sign-out information, traffic count, instrument approach count adjustments, and beacon code utilization.

Operational data is only published in Simple Schema XML format.

The following table shows all Operational Data messages available via SFDPS.

Code	Name	Description
AC	Instrument Approach Count Adjustment	<p>The Instrument Approach Count message is used to increment or decrement one of the following instrument approach counts:</p> <p>AC (air carrier) AT (air taxi) GA (general aviation) MI (military)</p>
AK	Traffic Count Adjustment	<p>The Traffic Count Adjustment message is used to increment or decrement one of the following traffic counts:</p> <p>ACDD (Air Carrier Domestic Departures) ATDD (Air Taxi Domestic Departures) GADD (General Aviation Domestic Departures) MIDD (Military Domestic Departures) ACDO (Air Carrier Domestic Overs) ATDO (Air Taxi Domestic Overs) GADO (General Aviation Domestic Overs) MIDO (Military Domestic Overs) ACOD (Air Carrier Oceanic Departures) ATOD (Air Taxi Oceanic Departures) GAOD (General Aviation Oceanic Departures) MIOD (Military Oceanic Departures) ACOO (Air Carrier Oceanic Overs) ATOO (Air Taxi Oceanic Overs) GAOO (General Aviation Oceanic Overs) MIOO (Military Oceanic Overs) VFRC (Visual Flight Rule [VFR] Traffic Count)</p>
SY	Sign In Sign Out	The Sign In/Sign Out (SY) message is sent each time a sign in or sign out occurs, or when a reconstitution request is received.
UB	Beacon Code Utilization	The Beacon Code Utilization message provides the peak number of beacon codes used, the total number of adapted codes, and the number of code reassignments since start-up or local midnight, for an adapted period of time.
UG	Geographic Beacon Code Utilization	The Geographic Beacon Code Utilization message provides the total number of adapted beacon codes for each destination region as well as the peak number of beacon codes used for each destination region during the period.

For details of Operational Data messages content refer to [Section 4.3 Operational Data Message Details](#).

2.4 General Messages

General Information Messages provide ad-hoc, freeform text messages entered by users of various systems for air traffic personnel to use for intra-facility and inter-facility communication. Other messages in this category allow for the transmission of status information.

General messages are only published in Simple Schema XML format.

The following table shows all General Information Data messages available via SFDPS.

Code	Name	Description
GH	General Information	A General Information message is used to communicate a free-form text message from one facility to one or more other facilities. The content of the message is free-form text.
HO	Hold Status Information	The Hold Status Information message provides hold information (holding fix and estimated fix departure time for definite-duration holds) on all active aircraft during the initialization process.
HE	Interim Altitude Status Information	The Interim Altitude Status Information message provides interim altitude status information on all active aircraft during the initialization process.
UI	Unsuccessful Information Transmission	The Unsuccessful Information Transmission (UI) message is sent by ERAM when transmission of flight data to a remote facility is unsuccessful either due to a transmission error or because transmission of the flight data to the remote facility is inhibited.
HS	ERAM Status Information	The ERAM Status Information message is sent when an ERAM status change occurs.

For details of General Data messages content refer to [Section 4.4 General Information Message Details](#).

2.5 Reconstitution Messages

This section describes reconstitution messages received from HADDs.

All of the reconstitution messages are published by SFDPS in Simple Schema XML format. DBRTFPI messages are also published in FIXM format.

Note:

Message descriptions were excerpted from: *Interface Control Document, NAS-IC-40010001 Revision E, For Interface between Host Interface Device (HID)/National Airspace System (NAS) Local Areal Network (LAN)(HNL), Applications, Host Air Traffic Management (ATM) Data Distribution System (HADDs)/Store and Forward Application (SAFA) & Their Client Applications Oct 25, 2011, Federal Aviation Administration, U.S. Department of Transportation*

Code	Name	Description
DBRTSI	Database Record Transfer Sector Assignment Information	Contains Fixed Posting Area (FPS) to sector assignment for a single sector. The transmitted data comes from the latest valid sector assignment status information message (SH) received by HADDs at the time of JMS client connection.
DBRTAI	Database Record Transfer Altimeter Status Information	Contains the current altimeter setting. The data comes from CMS altimeter setting information messages (HA) sent to HADDs by the ERAM, and includes altimeter reporting station, the altimeter reading, and the time received.
DBRTRI	Database Record Transfer Route Status Information	Contains the status of adapted departure and arrival routes. This message includes the information received from the CMS route status information message (HR) sent to HADDs by the ERAM.
DBRTFPI	Database Record Transfer Flight Plan Information	The transmitted data comes from the latest flight plan and track information received by HADDs at the time of JMS client connection.

For details of SFDPS Reconstitution messages content refer to [Section 4.5 Reconstitution Message Details](#).

2.6 Batched Track Messages

SFDPS groups all track messages into batches before publishing them to NEMS.

The message type is BATCH_TH for a batch in the SimpleXML format and BATCH_TH_FIXM for a batch in FIXM format. A batch can contain up to 100 individual track messages.

SFDPS uses the following properties assigned to each individual track message to construct the batches:

- Source Facility
- Sensitivity
- Authoritative
- One-minute Frequency

All track messages within a batch have the same values for all of the above properties. For example, a batch might contain track messages issued by ZBW Center that are authoritative, one-minute frequency, and not sensitive.

The SFDPSConnect client program has a method to extract and log the individual track message contained in the batches. See the RECONSTRUCT_TH_MESSAGES property in Appendix E and the SFDPSConnect Users Guide for more details.

2.7 SFDPS Derived Messages

This section lists message created by SFDPS to provide response to a customer request or to provide system status information. RReply messages are published in Simple Schema XML and FIXM format. Status messages are only published in Simple Schema XML format.

Code	Name	Description
RReply	Request-Reply	Response to a request for current flight data. Contains the latest flight plan data for a flight and the last track data if flight is active.
Status	SFDPS Status	<p>Periodic message sent to a customer indicating the status of the HADDs data feed from each ARTCC, time of the last sector status messages from each ARTCC, and time of the last route status message from each ARTCC.</p> <p>Ad hoc message to indicate to a consumer: the status of SFDPS database and any reconstitution activities; when communication to HADDs is lost and restored, when the SFDPS data reconstitution starts and completes.</p>

For details of SFDPS Derived messages content refer to [Section 4.6 SFDPS Derived Message Details](#).

3. SFDPS Message Properties and Header

SFDPS messages may consist of a combination of the following parts:

1. **JMS Properties** - Properties used by NEMS for routing and filtering. The properties are mainly accessible in messages received via Publish-Subscribe service. For Request-Response service, some of these properties are not defined.
2. **SFDPS Header** – XML fields based on the original message or added by SFDPS to provide additional information or context. This section is only available in Simple Schema XML messages.

3.1 JMS Properties

This section describes properties defined by SFDPS and used by NEMS for routing and filtering purposes. They are derived from the current message or from the stored messages related to the same flight.

Note:

The JMS properties are generally defined and used for NEMS routing purposes. For data publication, the data type, message type, and source facility associated with a received message are available in the JMS properties of the published message. For reply messages (messages received as a result of a request to SFDPS web service), the data type, message type, and source facility are not defined in the JMS properties, and must be determined from the message content of the received XML message.

JMS Property	Description	Possible Values	Required
FDPS_SourceSystem	Indicates which SFDPS system generated the message.	A string of up to 128 characters.	Yes
FDPS_SourceFacility	Denotes the facility that generated the message.	Alphanumeric	Yes
FDPS_MessageType	Indicates the message type received from the HADDs.		Yes
FDPS_FlightOperator	Shows the operator of the flight to which the message pertains.		No
FDPS_FlightId	Shows the flight identification (aircraft ID, call sign) of the flight to which the message pertains.		Yes (flight messages)
FDPS_Origin	Shows the origin of the flight to which the message pertains.		Yes (flight messages)
FDPS_DestID	Shows the destination of the flight to which the message pertains.		Yes (flight messages)
FDPS_OneMinFreq	This property, of type Boolean, is set to true on every fifth track message received from HADDs for a flight if the track messages are generated at a 12-second frequency	TRUE FALSE	

JMS Property	Description	Possible Values	Required
	<p>TRUE – This track message was generated one minute after the last track message for this flight that had a value of TRUE in this property.</p> <p>FALSE – This track message was received within a minute of the last track message for this flight that had a value of TRUE in this property.</p>		
FDPS_Sensitive	Indicates whether the message contains sensitive data or data related to sensitive flights.		Yes
FDPS_Restricted	Indicates whether the message is for a non-active flight, and if so, whether it contains beacon code data or not. Possible values are 'A' (message does not pertain to a flight or pertains to an active flight and can be shared with all users otherwise authorized to receive the message based on the FDPS_Sensitive property - regardless of whether the message contains beacon code data), 'R' (message contains beacon code data and pertains to a non-active flight, so the message can only be shared with users explicitly authorized to receive this data), or 'D' (message is for a non-active flight – beacon code data in the message has been redacted and the message can be shared only with users not authorized to receive beacon code data for non-active flights).	'A' 'D' 'R'	
FDPS_Authoritative	Shows whether the source for this message is the authoritative source for information about the flight to which the message pertains.		Yes (flight messages)
FDPS_RcvdTime	Shows the time at which the message was received by SFDPS.	Human-readable date/time.	Yes
FDPS_RcvdTimeEpoch	Shows the time at which the message was received by SFDPS.	Number of seconds since January 1, 1970.	Yes
FDPS_SentTime	Shows the time at which the message was sent by SFDPS to NEMS.	Human-readable date/time.	Yes

JMS Property	Description	Possible Values	Required
FDPS_SentTimeEpoch	Shows the time at which the message was sent by SFDPS to NEMS.	Number of seconds since January 1, 1970.	Yes
FDPS_SequenceNo	Sequence number internally generated by SFDPS.		Yes
FDPS_TopicId	Identifier for the JMS topic on which this message will be published.		Yes (Request-Response)
FDPS_DataType	Indicates the data type (format) of the message being published.	"AirspaceAIXM" "ERADP" "ERODP" "ERGMP" "FlightFIXM" "STATUS"	Yes (Publish-Subscribe)
FDPS_SubscriptionId	Identification number generated by SFDPS and associated with a specific request to SFDPS web service.	<request_time_epoch>- <request_type>- <topic_name>	Yes (Request-Response)

3.2 SFDPS Header

This section provides a list of all fields included in the SFDPS Header. The SFDPS Header is located in the top section of Simple Schema XML formatted messages.

Note:

Data sent in AIXM and FIXM formats do not have an SFDPS Header.

Field	Description	Required
center	Contains the three-letter center (ARTCC) code in the ZXX form. This corresponds to the JMS property: FDPS_SourceFacility .	Yes
msgTimes	Container element holds four fields: arrivalTime - the arrival time of the flight, in XML dateTime format. arrivalTimeEpoch - the arrival time of the flight, in seconds since January 1, 1970. departureTime - the departure time of the flight, in XML dateTime format. arrivalTimeEpoch - the departure time of the flight, in seconds since January 1, 1970.	Yes (flight messages)

Field	Description	Required
flightState	Contains the flight state. The possible values are: Active Cancelled Dropped Landed Proposed	Yes (flight messages)
flightStateActiveOrProposed	TRUE if flight state is active or proposed. FALSE otherwise.	Yes (flight messages)
fdpsGufi	<p>Contains the SFDPS GUFi.</p> <p>Correlating flight data has long been a difficult issue, especially for systems receiving data from multiple sources. (Correlating is the process for determining which messages apply to which flights.)</p> <p>The SFDPS GUFi is an identifier on every message that positively identifies what flight the message is for. SFDPS maintains a central database of flight data correlated by flight, not flight plan - a flight record in the database may be linked to more than one flight plan for that flight.</p> <p>The current SFDPS GUFi format consists of the country, the generator of the GUFi, the date-time the GUFi was created, and a sequence number to make GUFIs generated in the same second unique. The fields are separated by dots.</p> <p>e.g. us.fdpi.2013-0821T14:36:58Z.612/10875/28.</p> <p>The messages published by SFDPS in FIXM format conform to the FIXM 3.0 standard. The FIXM 3.0 GUFi follows the Universally Unique Identifier (UUID) standard.</p> <p>The current system architecture requires two separate installations of SFDPS, a primary and a backup; both accept data, but only one publishes it. The databases at the two sites are distinct and do not share information. As a result FIXM GUFIs generated by each site for the same flight are different. Should a fail-over occur, the new primary site would publish a FIXM GUFi different from a GUFi generated by the old primary site for the same flight. The SFDPS GUFi, which is identical in both databases for the same flight, helps to deal with this situation. It will allow a user to maintain a consistent sequence of messages for a flight even in a case of a failover.</p> <p>Currently, the GUFi is added by SFDPS. In future, an independent GUFi Service may be deployed and the format of the GUFi may change.</p>	Yes (flight messages)

Field	Description	Required
uuidGufi	Contains a unique identifier for a flight that conforms to the Universal Unique Identifier standard and conforms to the GUFi requirements of FIXM 3.0. e.g. 2fed5f3f-fd87-49d2-aa41-1ca73564504d.	
eramGufi_316a0	Contains the eramGufi, the unique flight plan identifier. e.g. KS05208101.	Yes (flight messages)
eramGufi_316aFPId	Contains the eramGufi flight plan identifier from the SFDPS system, the unique flight plan identifier. e.g. KS05208101	Yes (flight messages)
eramGufi_316aNum	Contains the SFDPS server and numeric date representation of the eramGufi flight plan used internally by SFDPS. e.g. 1305208101	Yes (flight messages)
eramGufi_316aDT	Contains the date and time representation of the eramGufi flight plan. e.g. 2014-03-10T09:12:27Z/000/08/500	Yes (flight messages)
flightPlanSeqNo	Contains the sequence number for each flight plan.	Yes (flight messages)
propSourceSystem	String of up to 128 characters. It indicates which SFDPS system generated the message.	Yes
propSourceFacility	Denotes the facility that generated the message.	Yes
propMessageType	Indicates the message type received from the HADDs.	Yes
propFlightOperator	Shows the operator of the flight to which the message pertains.	No
propFlightId	Shows the flight identification (aircraft id, call sign) of the flight to which the message pertains.	Yes (flight messages)
propOrigin	Shows the origin of the flight to which the message pertains.	Yes (flight messages)
propDestination	Shows the destination of the flight to which the message pertains.	Yes (flight messages)
propSensitive	Indicates whether the message contains sensitive data or data related to sensitive flights.	Yes
propAuthoritative	Shows whether the source for this message is the authoritative source for information about the flight to which the message pertains.	Yes (flight messages)
propRcvdTime	Shows the time at which the message was received by SFDPS. It is formatted as a human-readable date/time.	Yes
propRcvdTimeEpoch	Shows the time at which the message was received by SFDPS. It is in the form of the number of seconds since January 1, 1970.	Yes
propSentTime	Shows the time at which the message was sent from SFDPS to NEMS. It is formatted as a human-readable date/time.	Yes

Field	Description	Required
propSentTimeEpoch	Shows the time at which the message was sent from SFDPS to NEMS. It is in the form of the number of seconds since January 1, 1970.	Yes
propSeqNo	Contains a sequence number internally generated by SFDPS.	Yes
propTopicId	Contains the identifier for the JMS Topic on which this message will be published.	Yes (Request-Response)
propTestMsg	No longer used and will be omitted from the schema in the future.	n/a
propOneMinFreq	Allows Track (TH) messages to be distributed to a JMS client at one-minute intervals, rather than at their actual frequency, which is twelve seconds. This property should be set on every fifth TH message.	Yes (TH messages)
propRecon	Boolean field: TRUE means that this is a reconstitution message from the HADDs database. The default is FALSE.	No
propDataType	An enumerated field that specifies the type of the message. The possible values are: FlightSimpleXML ERADP ERODP ERGMP STATUS	Yes
propEnhancedData	Boolean field: TRUE means that this message contains enhanced data. Enhancements to the original CMS messages include: addition of FDPS GUF flight state flight plan sequence number Enhancement also includes functions such as removing redundant messages. The default is FALSE.	Yes (flight messages)
propReportingStation	Shows the reporting station for altimeter data. Optional, only relevant for altimeter setting (HA) messages. This property is no longer used and will be omitted from the schema in the future.	n/a
propReportingTime	Shows the time of the report for altimeter data in standard XML dateTime format (i.e., human-readable). Optional, only relevant for altimeter setting (HA) messages. This property is no longer used and will be omitted from the schema in the future.	n/a
propReportingTimeEpoch	Shows the time of the report for altimeter data in epoch time, that is, in the form of seconds since January 1, 1970.	n/a

Field	Description	Required
	Optional, only relevant for altimeter setting (HA) messages. This property is no longer used and will be omitted from the schema in the future.	
propRRSubscriptionId	Contains the subscription identifier for a Request-Response message.	Yes (Request-Response)
propRRSubscriptionResponseError	Contains an error code for a Request-Response message.	Yes (Request-Response)
propRRSubscriptionResponseErrorDescription	Contains an error text for a Request-Response message.	Yes (Request-Response)
propRRSeqNo	Contains a sequence number for a Request-Response message.	Yes (Request-Response)
propRRSeqNoMax	Contains the maximum sequence number for a Request-Response message.	Yes (Request-Response)
propFdpsRequestDestinationId	Contains the identification for the return address for a Request-Response message.	Yes (Request-Response)

4. SFDPS Message Body Content and Structure

This chapter provides detailed description of fields contained in the message body of the SFDPS message. Fields for every message for all four data publication services are listed and described below.

The message field names end (for the most part) in an underscore followed by two to three digits followed by one or more letters. These number/letter codes correspond to the CMS codes identifying the fields. The symbols d, a, and L refer to digits, alphanumerics, and uppercase letters, respectively.

Message fields are required unless described otherwise.

Note:

A large number of message field descriptions in this chapter were excerpted from the following document: *Interface Control Document, NAS-IC-82422412-01, REVISION B, En Route Automation Modernization (ERAM)/User Systems via Air Traffic Management (ATM) Intermediate Point of Presence (IPOP), April 30, 2012, Federal Aviation Administration, U.S. Department of Transportation*

4.1 Flight Data Messages Details

4.1.1 Flight Plan Information [FH]

The FH is the Flight Plan Information message. The Flight Plan Information [FH], Flight Amendment Information [AH] and Flight Plan Update Information [HU] messages have the same fields and structure.

The fields in the message are as follows:

1. **sourceId_00e**

This field is required on all messages sent from ERAM. It contains a time followed by a sequence number. The time is in the format hhmmss, where hh stands for the two-digit hour (00-23), mm for the two-digit minute (00-59), and ss for the two-digit second (00-59). The four-digit sequence number falls in the range 0000-9999.

2. **sourceTime_00e1**

This field is a breakdown of the first section of **sourceId_00e**. It contains a time in the format hh_mm_ss, where hh stands for the two-digit hour (00-23), mm for the two-digit minute (00-59), and ss for the two-digit second (00-59).

3. **sourceSeqNo_00e2**

This field is the second part of **sourceId_00e**. It is a sequence number. The four-digit sequence number falls in the range 0000-9999.

4. **flightId_02a**

This field is the Aircraft ID, or flight ID, or Call Sign. It has a variable format, starting with one uppercase alphabetic character, followed by one to six alphanumeric characters. When it is only two characters long, the format is one letter followed by one digit, such as A1 for Air Force One.

5. **computerId_02d**

The computer ID is represented by three alphanumeric characters. The allowed patterns are ddd, ddL, dLd, and dLL. The letters **I** and **O** are prohibited. One special all-alphabetic code may be used, literally **XXX**. This special code is only used in DA (Data Accept) messages in response to an ARTS VFR flight plan input. This field is optional.

6. **eramGufi_316a**

This field is a unique ID for each flight plan in the system.

The format consists of:

- ICAO country code, one letter
- en route facility ID, one letter
- time in seconds of current day, five digits (00000 – 86400)
- day of week, one digit (1-7)
- sequence number, two digits

The following fields are related to internal processing for the field **eramGufi_316a**:

- **eramGufi_316a0, eramGufi_316aNum, eramGufi_316aFPId**
Format: ICAO country code, one letter, en route facility ID, one letter; followed by time in seconds of current day, five digits (00000 – 86400), day of week, one digit (1-7), sequence number, two digits.
- **eramGufi_316aDT**
Format: yyyy-mm-dd T hh:mm:ss Z, followed by one or more digit

This field is optional.

7. **sspId_167a**

This field is the Site Specific Plan Identifier. The format is a one- to four-digit string in the range from 0 – 4000. Its value is assigned by Instrument Flight Procedures Automation (IFPA). It is unique for a flight plan in each ERAM facility. This field is optional.

8. **numberOfAircraft_03a**

This field indicates the number of aircraft for the flight. Its format is one to two digits followed optionally by one uppercase letter to represent the Special Aircraft Indicator. The indicator can also appear on its own, without digits. If no such designator has been assigned, or in case of formation flights comprising more than one type, **ZZZZ** is entered and the (numbers and) type(s) of aircraft are entered in the **TYPIndicator_918h** field. An example of the number of aircraft is a formation of military aircraft flying under one flight plan. An example Special Aircraft Indicator is **H** for Heavy Jet. This field is optional.

9. **typeOfAircraft_03c**

The Type of Aircraft field is one letter followed by one to four alphanumeric characters. Some examples: **B52**, **B747**.

10. **airborneEquip_03e**

This field is the Airborne Equipment Qualifier. It consists of one alphabetic or numeric character. Some sample values are:

- **A** – Transponder with no Mode C
- **B** – Transponder with Mode C
- **E** - Flight Management System (FMS) with DME/DME and IRU position updating
- **X** – No transponder
- **W** – RVSM

This field is optional.

11. **beaconCode_04a**

The beacon code is represented by four octal digits (i.e., 0-7). When the last two digits of the four digits are zero, the beacon code is a nondiscrete code, a code that is not unique. A discrete, or unique, beacon code is any code not ending in 00. This field is optional. In addition, even if this field were populated in the source message from ERAM, if the enclosing message pertains to a non-active flight, this element will not be present in the version of the message that is sent to non-authorized users by SFDPS.

12. **externalBeaconCode_04b**

The external beacon code is in the same format as the **beaconCode_04a** field. Field 04b will contain the requested beacon code when the flight plan is inbound from an adjacent Center (or an adjacent Non-U.S. Automated Facility), when the requested beacon code is different from the assigned beacon code, and when the aircraft is not established on the assigned beacon code. Then, if the facility is adapted to receive Field 04b, Field 04b will be transmitted. This field is optional. In addition, even if this field were populated in the source message from ERAM, if the enclosing message pertains to a non-active flight, this element will not be present in the version of the message that is sent to non-authorized users by SFDPS.

13. **trueAirSpeed_05a**

This field is represented in two to four digits, expressing true airspeed in the range 01 – 3700 knots.

14. **machSpeed_05c**

The mach speed is expressed as three digits with no decimal point, preceded by the letter **M**, up to M500. For example, the speed 0.85 Mach is represented by ‘M085’.

15. **classifiedSpeed_05d**

This field has a fixed value of **SC**. The adapted classified speed is not displayed on flight strips. The character string ‘SC’ is printed instead.

16. coordFix_06a

The coordination fix is the starting point from which to begin processing the flight plan route. It is from one of the following points:

- the departure airport,
- the airfile fix, or
- the adjacent center inbound coordination fix

For ARTS III flight plans, the coordination fix Field 06 is used as the inbound coordination fix or the outbound coordination fix or, for an ARTS internal flight, it can be the departure or destination airport. Because this field can represent a number of different things, there are multiple legal formats for it. It can be:

- A fix name consisting of two to five alphanumeric characters;
- A fix name with a radial and distance; fix name as above, followed by six digits;
- A lat/long: Four digits followed by an optional alpha character, followed by an forward slash('/'), followed by four to five digits, followed by an optional alpha character;
- A location identifier (LOCID): Three to four alphanumerics characters.

17. coordStatusTime_07d

This field is the starting time at the coordination fix (field 06a). The format is a single letter (one of **A**, **D**, **E**, **P**, or **F**) followed by four digits. The digits represent time as hhmm. The five alpha values represent:

- **A** – Active arrival flight plan for ARTS III only, aircraft is in the air
- **D** – Flight has departed from the departure airport
- **E** – Active flight plan, aircraft is in the air. For ARTS III 'E' indicates an overflight
- **F** – Flush flight plan. The adjacent Host Center is performing a shutdown. The adjacent center activates a pending Proposed flight plans with an 'F' Flush time and sends the flight plans to the adjacent ERAM. Flush times are only used Host to ERAM. The receiving ERAM processes the 'F' Flush time as a 'P' Proposed time.
- **P** – Proposed flight plan preparing for departure

18. coordStatus_07d1

The coordStatus field is the single letter, A, D, E, F, or P, as described above.

19. coordTime_07d2

The coordTime is the XML dateTime representing the starting time at the coordination fix.

20. delayTime_07e

This three-character field provides a delay time in minutes to be applied to the value in the 07d field.

21. assignedAlt_08a

This field represents an assigned altitude or flight level in hundreds of feet, in two to three digits. Three digits are required for ARTS III. For example, an assigned altitude of 340 means that the aircraft is to fly at 34,000 feet.

Only one of the five altitude fields, 08a through 08e, will appear in a message.

22. assignedAlt_08b

This field has a fixed value of **OTP**, which means the aircraft is flying VFR-On-Top, it is flying above the clouds in VFR conditions.

23. assignedAlt_08c

This field's format is **OTP/**, followed by two to three digits indicating altitude. It represents an IFR flight operating above the clouds in VFR conditions. The sample value **OTP/250** means the aircraft is flying VFR-On-Top at 25,000 feet.

24. assignedAlt_08d

This field is an assigned block of altitudes for the flight to fly. It consists of two to three digits followed by the letter **B**, followed by two to three digits. The digits represent altitude or flight level in hundreds of feet. The lowest altitude is listed first. An example: **80B140**, meaning the flight is assigned an altitude block of 8,000 feet to 14,000 feet.

25. assignedAlt_08e

This field is used for an IFR flight operating above a specified altitude. Its format is **ABV/** followed by two to three digits. An example: **ABV/600**, meaning the flight is flying above 60,000 feet.

26. assignedAlt_08f

This is the assigned altitude a flight will fly at, before, and after a fix. The format is a two to three digit altitude in hundreds of feet followed by a forward slash, a fix specifier (see "coordFix_06a" on page 20 for formats), followed by another forward slash, and, finally, two or three digits. For example, **240/DAL350010/220** means to fly at 24,000 feet until reaching the fix radial distance represented by DAL350010, and then descend to 22,000 feet. The fix cannot be the arrival or departure point.

27. assignedAlt_08g

This field can have only one value, '**VFR**', for Visual Flight Rules.

28. assignedAlt_08h

This field represents a VFR flight with an altitude. Its format is 'VFR/' followed by two or three digits showing altitude in hundreds of feet. An example is VFR/75 meaning the aircraft is flying VFR at 7,500 feet.

29. requestedAlt_09a

This field is the requested altitude or flight level in hundreds of feet, in two to three digits. Three digits are required for ARTS III. For example, an assigned altitude of **340** means that the aircraft is requesting to fly at 34,000 feet.

At most, only one of the Requested Altitude fields (09a – 09g) will be included in a proposed flight message.

30. requestedAlt_09b

This field has a fixed value of **OTP**, which means the aircraft is requesting to fly VFR-On-Top.

31. requestedAlt_09c

This field's format is **OTP/**, followed by two to three digits. It represents an IFR flight requesting to operate above the clouds in VFR conditions. The sample value **OTP/250** means the aircraft is requesting VFR-On-Top at 25,000 feet.

32. requestedAlt_09d

This field is used for an IFR flight requesting to operate above a specified altitude. Its format is **ABV/** followed by two to three digits. An example: **ABV/600**, meaning the flight is requesting to fly above 60,000 feet.

33. requestedAlt_09e

This field is an assigned block of altitudes the flight has requested. It consists of two to three digits followed by the letter 'B', followed by two to three digits. The digits represent altitude or flight level in hundreds of feet. The lowest altitude must be listed first. An example: **80B140**.

34. requestedAlt_09f

This field can have only one value, '**VFR**', for Visual Flight Rules.

35. requestedAlt_09g

This field represents a VFR flight with an altitude. Its format is 'VFR/' followed by two or three digits showing altitude in hundreds of feet.

36. flightPlanRoute_10a

The purpose of this field is to show how the flight will fly from the departure airport to the arrival airport. The route field 10 filed by the pilot can be very complex, considering that some flights fly half way around the world. Therefore, the route field contains several elements and sub-elements to describe the pilot's intentions as the flight progresses from the departure airport to the arrival airport. It is specified as a string field, which is made up of a chain of fixes and routes in the FIX.ROUTE.FIX format. Elements in the sequence can be implied, such as FIX..FIX, or ROUTE..ROUTE. A complete description of all the possible subfield formats is beyond the scope of this document. Here is an example: **OKC.V14S.TUL.TUL090..FYV270.FYV.**

37. departurePoint_26a

The departure point is the point at which to start processing a flight plan. Any of the allowed ways to represent a fix can be used in this field, including the standard airport designators. A fix name, lat/long, or fix-radial-distance can also be used. Some examples are: **AB, DFW, KDFW, SHP090015, 3500N/04000W.**

38. destination_27a

The destination is the point at which to end processing a flight plan. Any of the allowed ways to represent a fix can be used in this field, including the standard airport designators. A fix name, lat/long, or fix-radial-distance can also be used. Some examples are: **AB, DFW, KDFW, SHP090015, 3500N/04000W.**

39. FAV_143b0

Field 143b is the Uncombined Fixed Airspace Volume (FAV) number containing the first AAR Fix for the flight. Its format is four digits. This field is optional.

40. FAV_143b1

Field 143b is the Uncombined Fixed Airspace Volume (FAV) number containing the second AAR Fix for the flight. This field is optional.

41. FAV_143b2

Field 143b is the Uncombined FAV number containing the third AAR Fix for the flight. This field is optional.

42. FAV_143b3

Field 143b is the Uncombined FAV number containing the fourth AAR Fix for the flight. This field is optional.

43. ADARId_141a

If required for the flight, this field will contain the ADAR adapted departure arrival route name. The format is five alphanumeric characters. This field is optional.

44. ADRId_141b

If required for the flight, this field will contain the ADR adapted departure route name. The format is five alphanumeric characters. This field is optional.

45. AARId_141c

If required for the flight, this field will contain the AAR adapted arrival route name. The format is five alphanumeric characters. This field is optional.

46. ADARFld10_142a

This and the five following fields represent the Preferential Route Alphanumerics, which are used to control the flow and separation of traffic departing and arriving at designated airports. This field is a subsection of the field flightPlanRoute_10a. It consists of alphanumerics plus periods (‘.’) and forward slashes, with a length of four to 44 characters. A sample: **.PSX2.PSX.V20.CRP**. This field is optional.

47. ADARNonFld10_142b

This non-field 10 format field can be from four to 44 characters-- alphanumerics and spaces-- and is delimited by plus signs (‘+’). An example: **+TS1 MEM270 LIT050+**. This field is optional.

48. ADRFld10_142c

Field 142c can be from four to 84 characters, as describe above for field ADARFld10_142a. An example: **./WOTRO.MAIER4..** This field is optional.

49. ADRNonFld10_142d

This non-field 10 format field can be from four to 84 characters: alphanumerics, periods, forward slashes and spaces. The non-Field 10 portions are delimited by plus signs. An example: **+RV SACO58065+FMG.J32**. This field is optional.

50. AARFId10_142e

Field 142e consists of alphanumeric plus periods and forward slashes, with a length from four to 97 characters. An example: **./BLEUZ.RYTHM3**. This field is optional.

51. AARNonFId10_142f

Field 142f can be from four to 97 characters, as describe above for field ADARFId10_142a. An example: **J25.CRP+LISSE6+**. This field is optional.

52. remarks_11c

This field is an unrestricted string, from one to 400 characters in length. It has an attribute called remarktype with the possible values of **interfacility** or **intrafacility**. A few examples:

|ECON DESCENT

|FRC

|TCAS UNITED LIVERY

This field is optional.

53. flightRules_908a

This field represents the flight rules with a single character.

- **I** – IFR
- **V** – VFR
- **Y** – IFR First
- **Z** – VFR First

If **Y** or **Z** is used, the point or points at which a change of flight rules is planned should be shown in the route. This field is optional.

54. typeOfFlight_908b

This field represents the type of flight, in one single character. The possible values are:

- **S** – Scheduled air transport
- **N** - Non-scheduled air transport
- **G** – General aviation
- **M** - Military
- **X** – Other flights

This field is optional.

55. wakeTurbulenceCat_909c

The wake turbulence category is one character. The possible values are:

- **H** – Heavy
- **M** – Medium
- **L** – Light

This field is optional.

56. comNavApproachEquip_910a

This field consists of one to 25 letters. If the letter **N** appears, it must be alone. Any of the other letters (**A-M, O-P**) can occur together, but each letter may only appear once. Each letter represents the presence of radio communication, navigation, or approach aid equipment on the flight. An example: **SCHJ**. This field is optional.

57. survEquip_910b

This field represents surveillance equipment on the flight. It can be one or two letters long: if two, the second letter must be **D**, which indicates that the equipment has ADS capability. The possible values are:

- **N** - Nil
- **A** – Transponder Mode A
- **C** – Transponder Mode A and C
- **X** – Transponder mode S without both aircraft ID and pressure-altitude transmission
- **P** – Transponder Mode S, with pressure-altitude transmission but no aircraft ID transmission
- **I** – Transponder Mode S with aircraft ID transmission but no pressure-altitude transmission
- **S** – Transponder Mode S with both pressure-altitude and aircraft ID transmission
- **D** – ADS Capability

This field is optional.

58. comNavApproachEquipICAO2012_910c

This field is the ICAO 2012 version of field 910a. The allowed values are:

- **N** – No equipment is carried, or equipment is unserviceable
- **S** – Standard equipment is carried and is serviceable
- **A** – GBAS landing system
- **B** – LPV (APV with SBAS)

- **C** – LORAN C
- **D** – DME
- **E1** – FMC WPR ACARS
- **E2** – D-FIS ACARS
- **E3** – PDC ACARS
- **F** – ADF
- **G** – GNSS
- **H** – HF RTF
- **I** – Inertial Navigation
- **J1** – CPDLC ATN VDL Mode 2
- **J2** – CPDLC FANS 1/A HDFL
- **J3** – CPDLC FANS 1/A VDL Mode A
- **J4** – CPDLC FANS 1/A VDL Mode 2
- **J5** – CPDLC FANS 1/A SATCOM (INMARSAT)
- **J6** – CPDLC FANS 1/A SATCOM (MTSAT)
- **J7** – CPDLC FANS 1/A SATCOM (Iridium)
- **K** – MLS
- **L** – ILS
- **M1** – ATC RTF SATCOM (INMARSAT)
- **M2** – ATC RTF SATCOM (MTSAT)
- **M3** – ATC RTF (Iridium)
- **O** – VOR
- **P1-P9** – Reserved for RCP
- **R** – PBN approved
- **T** – TACAN
- **U** – UHF RTF
- **V** – VHF RTF
- **W** – RVSM approved
- **X** – MNPS approved
- **Y** – VHF with 8.33 kHz spacing capacity
- **Z** – Other equipment carried

An example field: **ADE3RV**. This field is optional.

59. survEquipICAO2012_910d

This field is the ICAO 2012 version of field 910b. The possible values are:

- **N** – No surveillance equipment or equipment unserviceable
- **A** – Transponder Mode A
- **C** – Transponder Mode A and C
- **E** – Transponder – Mode S, including aircraft identification, pressure-altitude and extended squitter (ADS-B) capability
- **H** – Transponder – Mode S, including aircraft identification, pressure-altitude and enhanced surveillance capability
- **I** – Transponder – Mode S, including aircraft identification, but no pressure-altitude capability
- **L** – Transponder – Mode S, including aircraft identification, pressure-altitude, extended squitter (ADS-B) and enhanced surveillance capability
- **P** – Transponder – Mode S, including pressure-altitude, but no aircraft identification
- **S** – Transponder – Mode S, including both pressure-altitude and aircraft identification capability
- **X** – Transponder - Mode S with neither aircraft identification nor pressure-altitude capability
- **B1** – ADS-B with dedicated 1090 MHz ADS-B “out” capability
- **B2** – ADS-B with dedicated 1090 MHz ADS-B “out” and “in” capability
- **U1** – ADS-B “out” capability using UAT
- **U2** – ADS-B “out” AND “IN” capability using UAT
- **V1** – ADS-B “out” capability using VDL Mode 4
- **V2** – ADS-B “out” and “in” capability using VDL Mode 4
- **D1** – ADS-C with FANS 1/A capabilities
- **G1** – ADS-C with ATN capabilities

A sample field: **HB2U2V2G1** . This field is optional.

60. altAero_916c

Contains the alternate arrival points or aerodromes, if any. More than one alternate may be shown, with spaces separating them. They can be in the four-letter ICAO form for an aerodrome, or any of the fix formats described above. If two or more alternatives are shown, they can be in any combination of valid formats. This field is optional.

61. ICAOStoredFormat_918a

This is a one-character field. Its only possible value is 0 (zero), which means that none of the following indicator fields (918b – 918x) will be present. This field is optional.

62. EETIndicator_918b

EET stands for Estimated Elapsed Time. This field gives the accumulated estimated elapsed times to significant points or FIR boundaries, as prescribed on the basis of regional air navigation agreements, or by the appropriate ATS authority.

The format of the EET Indicator field is freeform text, up to a total of 3,000 characters. A sample: MMID0114 SEGU0417 SPIM0455. This field is optional.

63. RIFIndicator_918c

RIF stands for Revised in Flight. Contains the details of the route to the revised destination aerodrome, followed by the ICAO four-letter location indicator of the aerodrome. The revised route is subject to re-clearance in flight. An example: DTA HEC KLAX. This field is optional.

64. REGIndicator_918d

REG stands for Registration. It shows the registration markings (tail number) of the aircraft, if different from the aircraft identification in flightId_02a (section 3.2.1.4.). This field is optional.

65. SELIndicator_918e

SEL is short for SELCAL code. The SELCAL is a selective-calling radio system that alerts aircraft crew to incoming radio communications. This field is optional.

66. OPRIndicator_918f

This field is the name of the aircraft operator, if not obvious from the aircraft identification in flightId_02a (section 3.2.1.4). This field is optional.

67. STSIndicator_918g

This field shows the reason for special handling by ATS, e.g., hospital aircraft. These are the only valid special handling indicators:

- ALTRV
- ATFMX
- FFR
- FLTCK
- HAZMAT
- HEAD
- HOSP
- HUM

- MARSA
- MEDEVAC
- NONRVSM
- SAR
- STATE
- NONRNP10
- NO NRPN10
- PROTECTED
- CARGO
- CARGO FLT

This field is optional.

68. TYPIndicator_918h

This field shows the type(s) of aircraft, preceded if necessary by number(s) of aircraft, if *ZZZZ* is inserted in numberOfAircraft_03a (section 3.2.1.8). This field is optional.

69. PERIndicator_918i

The PER field shows aircraft performance data. Example: MACH 2. This field is optional.

70. COMIndicator_918j

Contains significant data related to communication equipment on board, as required by the appropriate ATS authority. An example: UHF only. This field is optional.

71. DATIndicator_918k

DAT shows significant data related to data link capability. The possible values and their meanings are:

- **S** - satellite data link
- **H** - HF data link
- **V** – VHF data link
- **M** – SSR Mode S data link

The field can show one or more of the allowed letters. For example: SV. This field is optional.

72. NAVIndicator_918l

This field shows the significant data related to navigation equipment as required by the appropriate ATS authority. For example: INS. This field is optional.

73. DEPIIndicator_918m

This field shows the name of the departure aerodrome. If **ZZZZ** is inserted in Field 13, or the ICAO four-letter location indicator of the location of the ATS unit from which supplementary flight plan data can be obtained, if **AFIL** is inserted in Field 13.

Note: Field 13 does not appear in AH, FH, and HU messages. An example: NORTON FIELD. This field is optional.

74. DESTIndicator_918n

This field is the name of the destination aerodrome, if **ZZZZ** is inserted in field 16.

Note: Field 16 does not appear in AH, FH, and HU messages. Example: MILLSPAW FARM. This field is optional.

75. ALTNIndicator_918o

This field is the name of the alternate aerodrome(s), if **ZZZZ** is inserted in field 16.

Note: Field 16 does not appear in AH, FH, and HU messages. Example: MILLSPAW FARM. This field is optional.

76. RALTIndicator_918p

This field is the name of the en route alternate aerodrome(s). An example: JB RANCH. This field is optional.

77. CODEIndicator_918q

This field shows the aircraft Controller-Pilot Data Link Communications (CPDLC) address. A sample: 45FA16. This field is optional.

78. RACEIndicator_918r

This field shows the requested altitude and speed en route. An example: KRAFT/M080F380. This field is optional.

79. SURIndicator_918s

This field shows surveillance applications or capabilities not specified in localIntendedRoute_10b (section 3.2.1.120). An example: 282B. This field is optional.

80. DLEIndicator_918t

This field indicates an en route delay or holding, and is new in ICAO 2012. It shows a significant point on the route where a delay is planned, followed by a time in the form hhmm. Example: MDG0030. This field is optional.

81. TALTIndicator_918u

This field shows ICAO four-letter indicator(s) for take-off alternate(s), in the form of an aerodrome name or any of the fix specifications (i.e., lat/long, fix-radial-distance, or name). This field is optional.

82. DOFIndicator_918v

This field is the date of flight departure in a six-figure format yymmdd. This field is optional.

83. ORGNIndicator_918w

This field is the originator's eight-letter AFTN address or other appropriate contact details, in cases where the originator of the flight plan may not be readily identified, as required by the appropriate ATS authority. This field is optional.

84. PBNIndicator_918x

PBN stands for Performance Based Navigation. Up to eight two-character specifications may be included, for a total of 16 characters. The specifications are:

RNAV SPECIFICATIONS

- **A1** RNAV10 (RNP 10)
- **B1** RNAV 5 all permitted sensors
- **B2** RNAV 5 GNSS
- **B3** RNAV 5 DME/DME
- **B4** RNAV 5 VOR/DME
- **B5** RNAV 5 INS or IRS
- **B6** RNAV 5 LORANC
- **C1** RNAV 2 all permitted sensors

- **C2** RNAV 2 GNSS
- **C3** RNAV 2 DME/DME
- **C4** RNAV 2 DME/DME/IRU
- **D1** RNAV 1 all permitted sensors
- **D2** RNAV 1 GNSS
- **D3** RNAV 1 DME/DME
- **D4** RNAV 1 DME/DME/IRU

RNP SPECIFICATIONS

- **L1** RNP 4
- **O1** Basic RNP 1 all permitted sensors
- **O2** Basic RNP 1 GNSS
- **O3** Basic RNP 1 DME/DME
- **O4** Basic RNP 1 DME/DME/IRU
- **S1** RNP APCH
- **S2** RNP APCH with BAR-VNAV
- **T1** RNP AR APCH with RF (special authorization required)
- **T2** RNP AR APCH without RF (special authorization required)

This field is optional.

85. RNVArrival_925a

This field is the Area Navigation (RNAV) accuracy value for the arrival phase of the flight expressed in hundredths (.01) nm. The allowable range is 0001-9999. If the value is 0, the field is not included. Example: **0030**. This field is optional.

86. RNVENroute_925b

This field is the Area Navigation (RNAV) accuracy value for the en route phase of the flight expressed in hundredths (.01) nm. The allowable range is 0001-9999. If the value is 0, the field is not included. Example: **0030**. This field is optional.

87. RNVOceanic_925c

This field is the Area Navigation (RNAV) accuracy value for the oceanic phase of the flight expressed in hundredths (.01) nm. The allowable range is 0001-9999. If the value is 0 then the field is not included. Example: **0030**. This field is optional.

88. RNVDeparture_925d

This field is the Area Navigation (RNAV) accuracy value for the departure phase of the flight expressed in hundredths (.01) nm. The allowable range is 0001-9999. If the value is 0, the field is not included. Example: **0030**. This field is optional.

89. RNVSpare1_925e

This is a spare field. This field is optional.

90. RNVSpare2_925f

This is a spare field. This field is optional.

91. RNPArrival_925g

This field is the Required Navigation Performance (RNP) accuracy value for the arrival phase of the flight expressed in hundredths (.01) nm. The allowable range is 0001-9999. If the value is 0, the field is not included. Example: **0030**. This field is optional.

92. RNPEnroute_925h

This field is the Required Navigation Performance (RNP) accuracy value for the en route phase of the flight expressed in hundredths (.01) nm. The allowable range is 0001-9999. If the value is 0, the field is not included. Example: **0030**. This field is optional.

93. RNPOceanic_925i

This field is the Required Navigation Performance (RNP) accuracy value for the oceanic phase of the flight expressed in hundredths (.01) nm. The allowable range is 0001-9999. If the value is 0, the field is not included. Example: **0030**. This field is optional.

94. RNPDeparture_925j

This field is the Required Navigation Performance (RNP) accuracy value for the departure phase of the flight expressed in hundredths (.01) nm. The allowable range is 0001-9999. If the value is 0, the field is not included. Example: **0030**. This field is optional.

95. RNPSpare1_925k

This is a spare field. This field is optional.

96. RNPSpare2_925l

This is a spare field. This field is optional.

97. ICAO1stAdaptedField18_999a

Fields 999a through 999y are the data that are present for the optionally adapted element 918 indicators that are transmitted to CMS, when applicable, using a Field Reference Number of **999**, with elements **a** through **y**. They are formatted as free-form text. These fields are optional.

98. ICAO2ndAdaptedField18_999b

99. ICAO3rdAdaptedField18_999c

100. ICAO4thAdaptedField18_999d

101. ICAO5thAdaptedField18_999e

102. ICAO6thAdaptedField18_999f

103. ICAO7thAdaptedField18_999g

104. ICAO8thAdaptedField18_999h

105. ICAO9thAdaptedField18_999i

106. ICAO10thAdaptedField18_999j

107. ICAO11thAdaptedField18_999k

108. ICAO12thAdaptedField18_999l

109. ICAO13thAdaptedField18_999m

110. ICAO14thAdaptedField18_999n

111. ICAO15thAdaptedField18_999o

112. ICAO16thAdaptedField18_999p

113. ICAO17thAdaptedField18_999q

114. ICAO18thAdaptedField18_999r

115.ICAO19thAdaptedField18_999s

116.ICAO20thAdaptedField18_999t

117.ICAO21stAdaptedField18_999u

118.ICAO22ndAdaptedField18_999v

119.ICAO23rdAdaptedField18_999w

120.ICAO24thAdaptedField18_999x

121.ICAO25thAdaptedField18_999y

122.localIntendedRoute_10b

The Local Intended Route field is the flight plan route that is coordinated to penetrated facilities. It consists of the flight plan route with any expected-to-be-applied-by-the-controlling-center ADRs, ADARs or AARs already applied. It is intended for the clients that wish to know the expected state of the flight plan when the current facility releases control of the flight. Local Intended Route Field 10b contains the filed route (field 10a) merged with any locally applicable adapted routes (preferential routes, transition fixes and A-line fixes). Optional Field 10b will be sent to ATM-IPOP, when Field 10b is not the same as Field 10a. This field is optional.

123.ATCIntendedRoute_10c

The ATC Intended Route field is the current cleared flight plan route with any unacknowledged auto routes already applied. The ATC Intended Route includes to-be-applied AARs that are not to be notified in the current center. It is intended for clients that wish to know the currently expected route of the flight across contiguous ERAM airspace. Field 10c contains the filed route (field 10a) merged with any adapted routes (preferential routes, transition fixes and A-line fixes). Optional Field 10c will be sent to ATM-IPOP, when parameter Merged ATC Intended Route Switch (MARS) is ON and if either one of the following is true:

- If Field 10b exists and Field 10c is not the same as Field 10b
- If Field 10b does not exist and Field 10c is not the same as Field 10a (Flight Plan Route).

This field is optional.

4.1.2 Flight Amendment Information [AH]

The AH message is the Flight Amendment Information message. It contains all the same fields as the [FH message](#), but is used for a flight that has already been created by an FH message. That is, the AH should not be the first message for a particular flight.

The Flight Plan Information [FH], Flight Amendment Information [AH] and Flight Plan Update Information [HU] messages have the same fields and structure.

4.1.3 Converted Route Information [HX]

The HX message is the Converted Route Information message. It is sent to an ATM IPOP to provide fix and calculated time of arrival at each fix that describes an aircraft's ERAM converted route of flight.

The fields in the message are as follows:

1. sourceId_00e

This field is required on all messages sent from ERAM. It contains a time followed by a sequence number. The time is in the format hhmmss, where hh stands for the two-digit hour (00-23), mm for the two-digit minute (00-59), and ss for the two-digit second (00-59). The four-digit sequence number falls in the range 0000-9999.

2. sourceTime_00e1

This field is a breakdown of the first section of **sourceId_00e**. It contains a time in the format hh_mm_ss, where hh stands for the two-digit hour (00-23), mm for the two-digit minute (00-59), and ss for the two-digit second (00-59).

3. sourceSeqNo_00e2

This field is the second part of **sourceId_00e**. It is a sequence number. The four-digit sequence number falls in the range 0000-9999.

4. flightId_02a

This field is the Aircraft ID, or flight ID, or Call Sign. It has a variable format, starting with one uppercase alphabetic character, followed by one to six alphanumeric characters. When it is only two characters long, the format is one letter followed by one digit, such as A1 for Air Force One.

5. computerId_02d

The computer ID is represented by three alphanumeric characters. The allowed patterns are ddd, ddL, dLd, and dLL. The letters **I** and **O** are prohibited. One special all-alphabetic code may be used, literally **XXX**. This special code is only used in DA (Data Accept) messages in response to an ARTS VFR flight plan input. This field is optional.

6. sspId_167a

This field is the Site Specific Plan Identifier. The format is a one- to four-digit string in the range from 0 – 4000. Its value is assigned by Instrument Flight Procedures Automation (IFPA). It is unique for a flight plan in each ERAM facility. This field is optional.

7. **fixTime_68c**

This field is a fix and the expected time of arrival (in hours and minutes) at the specified fix. It must appear a minimum of two times, up to a maximum of 326 times, in the HX message. Its format is: one of the valid representations of a fix (coordFix_06a on page 20), followed by a forward slash, followed by the time in hhmm format. Some examples: **LFT/1800**, **JIMIE004034/1320**.

8. **fix_68c1**

This field and the following can be broken out, rather than combined in **fixTime_68c** above. If it appears, it will follow the full list of combined fix/time elements.

9. **crossingTime_68c2**

This is the time field, broken out from field **fixTime_68c** above, but in standard XML dateTime format rather than hhmm.

4.1.4 Cancellation Information [CL]

The CL message is the Cancellation Information message. It provides cancellation data for a flight plan.

The fields in the message are as follows:

1. **sourceId_00e**

This field is required on all messages sent from ERAM. It contains a time followed by a sequence number. The time is in the format hhmmss, where hh stands for the two-digit hour (00-23), mm for the two-digit minute (00-59), and ss for the two-digit second (00-59). The four-digit sequence number falls in the range 0000-9999.

2. **sourceTime_00e1**

This field is a breakdown of the first section of **sourceId_00e**. It contains a time in the format hh_mm_ss, where hh stands for the two-digit hour (00-23), mm for the two-digit minute (00-59), and ss for the two-digit second (00-59).

3. **sourceSeqNo_00e2**

This field is the second part of **sourceId_00e**. It is a sequence number. The four-digit sequence number falls in the range 0000-9999.

4. **flightId_02a**

This field is the Aircraft ID, or flight ID, or Call Sign. It has a variable format, starting with one uppercase alphabetic character, followed by one to six alphanumeric characters. When it is only two characters long, the format is one letter followed by one digit, such as A1 for Air Force One.

5. **computerId_02d**

The computer ID is represented by three alphanumeric characters. The allowed patterns are ddd, ddL, dLd, and dLL. The letters **I** and **O** are prohibited. One special all-alphabetic code may be used, literally **XXX**. This special code is only used in DA (Data Accept) messages in response to an ARTS VFR flight plan input. This field is optional.

6. **sspId_167a**

This field is the Site Specific Plan Identifier. The format is a one- to four-digit string in the range from 0 – 4000. Its value is assigned by Instrument Flight Procedures Automation (IFPA). It is unique for a flight plan in each ERAM facility. This field is optional.

7. **departurePoint_26a**

The departure point is the point at which to start processing a flight plan. Any of the allowed ways to represent a fix can be used in this field, including the standard airport designators. A fix name, lat/long, or fix-radial-distance can also be used. Some examples are: **AB, DFW, KDFW, SHP090015, 3500N/04000W**.

8. **destination_27a**

The destination is the point at which to end processing a flight plan. Any of the allowed ways to represent a fix can be used in this field, including the standard airport designators. A fix name, lat/long, or fix-radial-distance can also be used. Some examples are: **AB, DFW, KDFW, SHP090015, 3500N/04000W**.

4.1.5 Departure Information [DH]

The DH message is the Departure Information message. It provides cancellation data for a flight plan.

The fields in the message are as follows:

1. **sourceId_00e**

This field is required on all messages sent from ERAM. It contains a time followed by a sequence number. The time is in the format hhmmss, where hh stands for the two-digit hour (00-23), mm for the two-digit minute (00-59), and ss for the two-digit second (00-59). The four-digit sequence number falls in the range 0000-9999.

2. **sourceTime_00e1**

This field is a breakdown of the first section of **sourceId_00e**. It contains a time in the format hh_mm_ss, where hh stands for the two-digit hour (00-23), mm for the two-digit minute (00-59), and ss for the two-digit second (00-59).

3. **sourceSeqNo_00e2**

This field is the second part of **sourceId_00e**. It is a sequence number. The four-digit sequence number falls in the range 0000-9999.

4. **flightId_02a**

This field is the Aircraft ID, or flight ID, or Call Sign. It has a variable format, starting with one uppercase alphabetic character, followed by one to six alphanumeric characters. When it is only two characters long, the format is one letter followed by one digit, such as A1 for Air Force One.

5. **computerId_02d**

The computer ID is represented by three alphanumeric characters. The allowed patterns are ddd, ddL, dLd, and dLL. The letters **I** and **O** are prohibited. One special all-alphabetic code may be used, literally **XXX**. This special code is only used in DA (Data Accept) messages in response to an ARTS VFR flight plan input. This field is optional.

6. **sspId_167a**

This field is the Site Specific Plan Identifier. The format is a one- to four-digit string in the range from 0 – 4000. Its value is assigned by Instrument Flight Procedures Automation (IFPA). It is unique for a flight plan in each ERAM facility. This field is optional.

7. **numberOfAircraft_03a**

This field indicates the number of aircraft for the flight. Its format is one to two digits followed optionally by one uppercase letter to represent the Special Aircraft Indicator. The indicator can also appear on its own, without digits. If no such designator has been assigned, or in case of formation flights comprising more than one type, **ZZZZ** is entered and the (numbers and) type(s) of aircraft are entered in the **TYPIndicator_918h** field. An example of the number of aircraft is a formation of military aircraft flying under one flight plan. An example Special Aircraft Indicator is **H** for Heavy Jet. This field is optional.

8. **typeOfAircraft_03c**

The Type of Aircraft field is one letter followed by one to four alphanumeric characters. Some examples: **B52**, **B747**.

9. **airborneEquip_03e**

This field is the Airborne Equipment Qualifier. It consists of one alphabetic or numeric character. Some sample values are:

- **A** – Transponder with no Mode C
- **B** – Transponder with Mode C
- **E** - Flight Management System (FMS) with DME/DME and IRU position updating
- **G** - Global Navigation Satellite System (GNSS), including GPS or WAAS, with en route and terminal capability

- **X** – No transponder
- **W** – RVSM

This field is optional.

10. **departurePoint_26a**

The departure point is the point at which to start processing a flight plan. Any of the allowed ways to represent a fix can be used in this field, including the standard airport designators. A fix name, lat/long, or fix-radial-distance can also be used. Some examples are: **AB, DFW, KDFW, SHP090015, 3500N/04000W**.

11. **coordStatusTime_07d**

This field is the starting time at the coordination fix (field 06a). The format is a single letter (one of **A, D, E, P**, or **F**) followed by four digits. The digits represent time as hhmm. The five alpha values represent:

- **A** – Active arrival flight plan for ARTS III only, aircraft is in the air
- **D** – Flight has departed from the departure airport
- **E** – Active flight plan, aircraft is in the air. For ARTS III ‘E’ indicates an overflight
- **F** – Flush flight plan. The adjacent Host Center is performing a shutdown. The adjacent center activates a pending Proposed flight plans with an ‘F’ Flush time and sends the flight plans to the adjacent ERAM. Flush times are only used Host to ERAM. The receiving ERAM processes the ‘F’ Flush time as a ‘P’ Proposed time.
- **P** – Proposed flight plan preparing for departure

12. **coordStatus_07d1**

The coordStatus field is the single letter, **A, D, E, F**, or **P**, as described above.

13. **destination_27a**

The destination is the point at which to end processing a flight plan. Any of the allowed ways to represent a fix can be used in this field, including the standard airport designators. A fix name, lat/long, or fix-radial-distance can also be used. Some examples are: **AB, DFW, KDFW, SHP090015, 3500N/04000W**.

14. **ETA_28a**

This field is the estimated time of arrival at the flight plan destination. Its format is XML dateTime. This field is optional.

4.1.6 Aircraft Identification Amendment Information [IH]

The IH message is the Aircraft Identification Amendment Information message. It is sent by ERAM to indicate a change to the flight identification field (field 02a) or assignment of computer identification (field 02d) for a flight plan.

The fields in the message are as follows:

1. **sourceId_00e**

This field is required on all messages sent from ERAM. It contains a time followed by a sequence number. The time is in the format hhmmss, where hh stands for the two-digit hour (00-23), mm for the two-digit minute (00-59), and ss for the two-digit second (00-59). The four-digit sequence number falls in the range 0000-9999.

2. **sourceTime_00e1**

This field is a breakdown of the first section of **sourceId_00e**. It contains a time in the format hh_mm_ss, where hh stands for the two-digit hour (00-23), mm for the two-digit minute (00-59), and ss for the two-digit second (00-59).

3. **sourceSeqNo_00e2**

This field is the second part of **sourceId_00e**. It is a sequence number. The four-digit sequence number falls in the range 0000-9999.

4. **flightId_02a**

This field is the Aircraft ID, or flight ID, or Call Sign. It has a variable format, starting with one uppercase alphabetic character, followed by one to six alphanumeric characters. When it is only two characters long, the format is one letter followed by one digit, such as A1 for Air Force One.

5. **computerId_02d**

The computer ID is represented by three alphanumeric characters. The allowed patterns are ddd, ddL, dLd, and dLL. The letters **I** and **O** are prohibited. One special all-alphabetic code may be used, literally **XXX**. This special code is only used in DA (Data Accept) messages in response to an ARTS VFR flight plan input. This field is optional.

6. **sspId_167a**

This field is the Site Specific Plan Identifier. The format is a one- to four-digit string in the range from 0 – 4000. Its value is assigned by Instrument Flight Procedures Automation (IFPA). It is unique for a flight plan in each ERAM facility. This field is optional.

7. **newFlightId_02aN**

This field is the new Aircraft ID, or flight ID (also called Call Sign), that has been changed by the IH message. It has a variable format, starting with one uppercase alphabetic character, followed by one to six alphanumeric characters. When it is only two characters long, the format must be one letter followed by one digit, such as A1 for Air Force One.

8. **newComputerId_02dN**

This field is the new Computer ID that has been changed by the IH message. The computer ID is represented by three alphanumeric characters. The allowed patterns are ddd, ddL, dLd, and dLL. The letters **I** and **O** are prohibited. One special all alphabetic code may be used, literally, **XXX**. This is only used in DA (Data Accept) messages in response to an ARTS VFR flight plan input. This field is optional.

9. **newSspId_167aN**

This field is the Site Specific Plan Identifier. The format is a one- to four-digit string in a range from 0 – 4000. Its value is assigned by Instrument Flight Procedures Automation (IFPA), and is unique for a system plan in each ERAM facility. This field is optional.

10. **departurePoint_26a**

The departure point is the point at which to start processing a flight plan. Any of the allowed ways to represent a fix can be used in this field, including the standard airport designators. A fix name, lat/long, or fix-radial-distance can also be used. Some examples are: **AB, DFW, KDFW, SHP090015, 3500N/04000W**.

11. **destination_27a**

The destination is the point at which to end processing a flight plan. Any of the allowed ways to represent a fix can be used in this field, including the standard airport designators. A fix name, lat/long, or fix-radial-distance can also be used. Some examples are: **AB, DFW, KDFW, SHP090015, 3500N/04000W**.

4.1.7 Hold Information [HH]

The HH message is the Hold Information message. It indicates a hold of a definite duration, an indefinite hold, or hold release for a specified flight.

The fields in the message are as follows:

1. **sourceId_00e**

This field is required on all messages sent from ERAM. It contains a time followed by a sequence number. The time is in the format hhmmss, where hh stands for the two-digit hour (00-23), mm for

the two-digit minute (00-59), and ss for the two-digit second (00-59). The four-digit sequence number falls in the range 0000-9999.

2. sourceTime_00e1

This field is a breakdown of the first section of **sourceId_00e**. It contains a time in the format hh_mm_ss, where hh stands for the two-digit hour (00-23), mm for the two-digit minute (00-59), and ss for the two-digit second (00-59).

3. sourceSeqNo_00e2

This field is the second part of **sourceId_00e**. It is a sequence number. The four-digit sequence number falls in the range 0000-9999.

4. flightId_02a

This field is the Aircraft ID, or flight ID, or Call Sign. It has a variable format, starting with one uppercase alphabetic character, followed by one to six alphanumeric characters. When it is only two characters long, the format is one letter followed by one digit, such as A1 for Air Force One.

5. computerId_02d

The computer ID is represented by three alphanumeric characters. The allowed patterns are ddd, ddL, dLd, and dLL. The letters **I** and **O** are prohibited. One special all-alphabetic code may be used, literally **XXX**. This special code is only used in DA (Data Accept) messages in response to an ARTS VFR flight plan input. This field is optional.

6. sspId_167a

This field is the Site Specific Plan Identifier. The format is a one- to four-digit string in the range from 0 – 4000. Its value is assigned by Instrument Flight Procedures Automation (IFPA). It is unique for a flight plan in each ERAM facility. This field is optional.

7. holdDataFix_21a

This field shows the fix at which the flight is to hold along the filed route of flight. If this field is input without the optional time element (holdDataTime_21d below), the flight will go into an indefinite hold status when the flight arrives at the holding fix. Any of the valid fix specifiers can be used, as shown in field **coordFix_06a**. This field is optional.

8. holdDataTime_21d

This field is used to specify the time the flight can expect further clearance at the holding location. It is in hhmm format. This field is optional.

9. **holdDataAction_21e**

This field can only have one value, **C**, which indicates the cancellation of the current hold status for the flight. This field is optional.

4.1.8 Progress Report Information [PH]

The PH message is the Progress Report Information message. It updates the position of an active flight plan, or releases it from a prior hold status.

The fields in the message are as follows:

1. **sourceId_00e**

This field is required on all messages sent from ERAM. It contains a time followed by a sequence number. The time is in the format hhmmss, where hh stands for the two-digit hour (00-23), mm for the two-digit minute (00-59), and ss for the two-digit second (00-59). The four-digit sequence number falls in the range 0000-9999.

2. **sourceTime_00e1**

This field is a breakdown of the first section of **sourceId_00e**. It contains a time in the format hh_mm_ss, where hh stands for the two-digit hour (00-23), mm for the two-digit minute (00-59), and ss for the two-digit second (00-59).

3. **sourceSeqNo_00e2**

This field is the second part of **sourceId_00e**. It is a sequence number. The four-digit sequence number falls in the range 0000-9999.

4. **flightId_02a**

This field is the Aircraft ID, or flight ID, or Call Sign. It has a variable format, starting with one uppercase alphabetic character, followed by one to six alphanumeric characters. When it is only two characters long, the format is one letter followed by one digit, such as A1 for Air Force One.

5. **computerId_02d**

The computer ID is represented by three alphanumeric characters. The allowed patterns are ddd, ddL, dLd, and dLL. The letters **I** and **O** are prohibited. One special all-alphabetic code may be used, literally **XXX**. This special code is only used in DA (Data Accept) messages in response to an ARTS VFR flight plan input. This field is optional.

6. **sspId_167a**

This field is the Site Specific Plan Identifier. The format is a one- to four-digit string in the range from 0 – 4000. Its value is assigned by Instrument Flight Procedures Automation (IFPA). It is unique for a flight plan in each ERAM facility. This field is optional.

7. **progressReportFix_18a**

This field is used to specify the position location report of the flight along the filed route of flight. It uses the standard fix formats, as shown in field **coordFix_06a** (coordFix_06a on pae 20).

8. **progressReportTime_18d**

This field is used to specify the time of the flight arriving at the fix specified in field **progressReportFix_18a**, above. It is in hhmm format, with values from 0000 – 2359.

4.1.9 Flight Arrival Information [HV]

The HV message is the Flight Arrival Information message. It provides arrival data from ERAM.

The fields in the message are as follows:

1. **sourceId_00e**

This field is required on all messages sent from ERAM. It contains a time followed by a sequence number. The time is in the format hhmmss, where hh stands for the two-digit hour (00-23), mm for the two-digit minute (00-59), and ss for the two-digit second (00-59). The four-digit sequence number falls in the range 0000-9999.

2. **sourceTime_00e1**

This field is a breakdown of the first section of **sourceId_00e**. It contains a time in the format hh_mm_ss, where hh stands for the two-digit hour (00-23), mm for the two-digit minute (00-59), and ss for the two-digit second (00-59).

3. **sourceSeqNo_00e2**

This field is the second part of **sourceId_00e**. It is a sequence number. The four-digit sequence number falls in the range 0000-9999.

4. **flightId_02a**

This field is the Aircraft ID, or flight ID, or Call Sign. It has a variable format, starting with one uppercase alphabetic character, followed by one to six alphanumeric characters. When it is only two characters long, the format is one letter followed by one digit, such as A1 for Air Force One.

5. **computerId_02d**

The computer ID is represented by three alphanumeric characters. The allowed patterns are ddd, ddL, dLd, and dLL. The letters **I** and **O** are prohibited. One special all-alphabetic code may be used, literally **XXX**. This special code is only used in DA (Data Accept) messages in response to an ARTS VFR flight plan input. This field is optional.

6. **sspId_167a**

This field is the Site Specific Plan Identifier. The format is a one- to four-digit string in the range from 0 – 4000. Its value is assigned by Instrument Flight Procedures Automation (IFPA). It is unique for a flight plan in each ERAM facility. This field is optional.

7. **departurePoint_26a**

The departure point is the point at which to start processing a flight plan. Any of the allowed ways to represent a fix can be used in this field, including the standard airport designators. A fix name, lat/long, or fix-radial-distance can also be used. Some examples are: **AB, DFW, KDFW, SHP090015, 3500N/04000W**.

8. **destination_27a**

The destination is the point at which to end processing a flight plan. Any of the allowed ways to represent a fix can be used in this field, including the standard airport designators. A fix name, lat/long, or fix-radial-distance can also be used. Some examples are: **AB, DFW, KDFW, SHP090015, 3500N/04000W**.

9. **arrivalTime_28b**

This field is the reported arrival time. The format is Ldddd where L = A if the time received in field 00 of a TB message caused the flight to be dropped; L = E if the flight is dropped by application of AFDI or EFDI. The dddd= hhmm.

4.1.10 **Flight Plan Update Information [HU]**

The HU is the Flight Plan Update Information message. It contains all the same fields as the [Flight Plan \[FH\] message](#).

The Flight Plan Information [FH], Flight Amendment Information [AH] and Flight Plan Update Information [HU] messages have the same fields and structure.

4.1.11 Expected Departure Time Information [ET]

The ET message is the Expected Departure Time Information message. It provides Estimated Departure Clearance Time (EDCT) information (i.e. the assigned flight departure time on a proposed flight plan inbound to a controlled airport with a ground delay program in effect).

The fields in the message are as follows:

1. sourceId_00e

This field is required on all messages sent from ERAM. It contains a time followed by a sequence number. The time is in the format hhmmss, where hh stands for the two-digit hour (00-23), mm for the two-digit minute (00-59), and ss for the two-digit second (00-59). The four-digit sequence number falls in the range 0000-9999.

2. sourceTime_00e1

This field is a breakdown of the first section of **sourceId_00e**. It contains a time in the format hh_mm_ss, where hh stands for the two-digit hour (00-23), mm for the two-digit minute (00-59), and ss for the two-digit second (00-59).

3. sourceSeqNo_00e2

This field is the second part of **sourceId_00e**. It is a sequence number. The four-digit sequence number falls in the range 0000-9999.

4. flightId_02a

This field is the Aircraft ID, or flight ID, or Call Sign. It has a variable format, starting with one uppercase alphabetic character, followed by one to six alphanumeric characters. When it is only two characters long, the format is one letter followed by one digit, such as A1 for Air Force One.

5. computerId_02d

The computer ID is represented by three alphanumeric characters. The allowed patterns are ddd, ddL, dLd, and dLL. The letters **I** and **O** are prohibited. One special all-alphabetic code may be used, literally **XXX**. This special code is only used in DA (Data Accept) messages in response to an ARTS VFR flight plan input. This field is optional.

6. **sspId_167a**

This field is the Site Specific Plan Identifier. The format is a one- to four-digit string in the range from 0 – 4000. Its value is assigned by Instrument Flight Procedures Automation (IFPA). It is unique for a flight plan in each ERAM facility. This field is optional.

7. **EDCT_92a**

This field is the Estimated Departure Clearance Time in hhmm format.

8. **cancellationIndicator_92b**

This field is used to cancel the EDCT for an aircraft. It has a fixed value of **C** meaning that the flight is no longer part of a ground delay program.

4.1.12 **Position Update Information [HP]**

The HP message is the Position Update Information message. It is used to update the coordination time on an active flight when the present position fix time is updated.

The fields in the message are as follows:

1. **sourceId_00e**

This field is required on all messages sent from ERAM. It contains a time followed by a sequence number. The time is in the format hhmmss, where hh stands for the two-digit hour (00-23), mm for the two-digit minute (00-59), and ss for the two-digit second (00-59). The four-digit sequence number falls in the range 0000-9999.

2. **sourceTime_00e1**

This field is a breakdown of the first section of **sourceId_00e**. It contains a time in the format hh_mm_ss, where hh stands for the two-digit hour (00-23), mm for the two-digit minute (00-59), and ss for the two-digit second (00-59).

3. **sourceSeqNo_00e2**

This field is the second part of **sourceId_00e**. It is a sequence number. The four-digit sequence number falls in the range 0000-9999.

4. **flightId_02a**

This field is the Aircraft ID, or flight ID, or Call Sign. It has a variable format, starting with one uppercase alphabetic character, followed by one to six alphanumeric characters. When it is only two characters long, the format is one letter followed by one digit, such as A1 for Air Force One.

5. **computerId_02d**

The computer ID is represented by three alphanumeric characters. The allowed patterns are ddd, ddL, dLd, and dLL. The letters **I** and **O** are prohibited. One special all-alphabetic code may be used, literally **XXX**. This special code is only used in DA (Data Accept) messages in response to an ARTS VFR flight plan input. This field is optional.

6. **sspId_167a**

This field is the Site Specific Plan Identifier. The format is a one- to four-digit string in the range from 0 – 4000. Its value is assigned by Instrument Flight Procedures Automation (IFPA). It is unique for a flight plan in each ERAM facility. This field is optional.

7. **coordStatusTime_07d**

This field is the starting time at the coordination fix (field 06a). The format is a single letter (one of **A**, **D**, **E**, **P**, or **F**) followed by four digits. The digits represent time as hhmm. The five alpha values represent:

- **A** – Active arrival flight plan for ARTS III only, aircraft is in the air
- **D** – Flight has departed from the departure airport
- **E** – Active flight plan, aircraft is in the air. For ARTS III ‘E’ indicates an overflight
- **F** – Flush flight plan. The adjacent Host Center is performing a shutdown. The adjacent center activates a pending Proposed flight plans with an ‘F’ Flush time and sends the flight plans to the adjacent ERAM. Flush times are only used Host to ERAM. The receiving ERAM processes the ‘F’ Flush time as a ‘P’ Proposed time.
- **P** – Proposed flight plan preparing for departure

8. **coordStatus_07d1**

The coordStatus field is the single letter, A, D, E, F, or P, as described above.

9. **coordTime_07d2**

The coordTime is the XML dateTime representing the starting time at the coordination fix.

10. **delayTime_07e**

This field shows a provide delay field. Its format is three digits representing time in minutes.

4.1.13 Tentative Flight Plan Information [NP]

The NP message is the Tentative Flight Plan Information Message. It is sent when a tentative flight plan is created. The NP message is also transmitted during reconstitution.

The fields in the message are as follows:

1. sourceId_00e

This field is required on all messages sent from ERAM. It contains a time followed by a sequence number. The time is in the format hhmmss, where hh stands for the two-digit hour (00-23), mm for the two-digit minute (00-59), and ss for the two-digit second (00-59). The four-digit sequence number falls in the range 0000-9999.

2. sourceTime_00e1

This field is a breakdown of the first section of **sourceId_00e**. It contains a time in the format hh_mm_ss, where hh stands for the two-digit hour (00-23), mm for the two-digit minute (00-59), and ss for the two-digit second (00-59).

3. sourceSeqNo_00e2

This field is the second part of **sourceId_00e**. It is a sequence number. The four-digit sequence number falls in the range 0000-9999.

4. Error! Bookmark not defined.flightId_02a

This field is the Aircraft ID, or flight ID, or Call Sign. It has a variable format, starting with one uppercase alphabetic character, followed by one to six alphanumeric characters. When it is only two characters long, the format is one letter followed by one digit, such as A1 for Air Force One.

5. computerId_02d

The computer ID is represented by three alphanumeric characters. The allowed patterns are ddd, ddL, dLd, and dLL. The letters **I** and **O** are prohibited. One special all-alphabetic code may be used, literally **XXX**. This special code is only used in DA (Data Accept) messages in response to an ARTS VFR flight plan input. This field is optional.

6. eramGufi_316a

This field is a unique ID for each flight plan in the system. The format consists of:

- ICAO country code, one letter
- en route facility ID, one letter
- time in seconds of current day, five digits (00000 – 86400)
- day of week, one digit (1-7)

- sequence number, two digits

The following fields are related to internal processing for the field **eramGufi_316a**:

- **eramGufi_316a0, eramGufi_316aNum, eramGufi_316aFPId**
Format: ICAO country code, one letter, en route facility ID, one letter; followed by time in seconds of current day, five digits (00000 – 86400), day of week, one digit (1-7), sequence number, two digits.
- **eramGufi_316aDT**
Format: yyyy-mm-dd T hh:mm:ss Z, followed by one or more digit

This field is optional.

7. **sspId_167a**

This field is the Site Specific Plan Identifier. The format is a one- to four-digit string in the range from 0 – 4000. Its value is assigned by Instrument Flight Procedures Automation (IFPA). It is unique for a flight plan in each ERAM facility. This field is optional.

8. **numberOfAircraft_03a**

This field indicates the number of aircraft for the flight. Its format is one to two digits followed optionally by one uppercase letter to represent the Special Aircraft Indicator. The indicator can also appear on its own, without digits. If no such designator has been assigned, or in case of formation flights comprising more than one type, **ZZZZ** is entered and the (numbers and) type(s) of aircraft are entered in the **TYPIndicator_918h** field. An example of the number of aircraft is a formation of military aircraft flying under one flight plan. An example Special Aircraft Indicator is **H** for Heavy Jet. This field is optional.

9. **typeOfAircraft_03c**

The Type of Aircraft field is one letter followed by one to four alphanumeric characters. Some examples: **B52**, **B747**.

10. **airborneEquip_03e**

This field is the Airborne Equipment Qualifier. It consists of one alphabetic or numeric character. Some sample values are:

- **A** – Transponder with no Mode C
- **B** – Transponder with Mode C
- **E** - Flight Management System (FMS) with DME/DME and IRU position updating
- **G** - Global Navigation Satellite System (GNSS), including GPS or WAAS, with en route and terminal capability

- **X** – No transponder
- **W** – RVSM

This field is optional.

11. beaconCode_04a

The beacon code is represented by four octal digits (i.e., 0-7). When the last two digits of the four digits are zero, the beacon code is a nondiscrete code, a code that is not unique. A discrete, or unique, beacon code is any code not ending in 00. This field is optional. In addition, even if this field were populated in the source message from ERAM, if the enclosing message pertains to a non-active flight, this element will not be present in the version of the message that is sent to non-authorized users by SFDPS.

12. trueAirSpeed_05a

This field is represented in two to four digits, expressing true airspeed in the range 01 – 3700 knots.

13. machSpeed_05c

The mach speed is expressed as three digits with no decimal point, preceded by the letter **M**, up to M500. For example, the speed 0.85 Mach is represented by ‘M085’.

14. classifiedSpeed_05d

This field has a fixed value of **SC**. The adapted classified speed is not displayed on flight strips. The character string ‘SC’ is printed instead.

15. assignedAlt_08a

This field represents an assigned altitude or flight level in hundreds of feet, in two to three digits. Three digits are required for ARTS III. For example, an assigned altitude of 340 means that the aircraft is to fly at 34,000 feet.

Only one of the five altitude fields, 08a through 08e, will appear in a message.

16. assignedAlt_08b

This field has a fixed value of **OTP**, which means the aircraft is flying VFR-On-Top, it is flying above the clouds in VFR conditions.

17. assignedAlt_08c

This field's format is **OTP/**, followed by two to three digits indicating altitude. It represents an IFR flight operating above the clouds in VFR conditions. The sample value **OTP/250** means the aircraft is flying VFR-On-Top at 25,000 feet.

18. assignedAlt_08d

This field is an assigned block of altitudes for the flight to fly. It consists of two to three digits followed by the letter **B**, followed by two to three digits. The digits represent altitude or flight level in hundreds of feet. The lowest altitude is listed first. An example: **80B140**, meaning the flight is assigned an altitude block of 8,000 feet to 14,000 feet.

19. assignedAlt_08e

This field is used for an IFR flight operating above a specified altitude. Its format is **ABV/** followed by two to three digits. An example: **ABV/600**, meaning the flight is flying above 60,000 feet.

20. assignedAlt_08f

This is the assigned altitude a flight will fly at, before, and after a fix. The format is a two to three digit altitude in hundreds of feet followed by a forward slash, a fix specifier (see "coordFix_06a" on page 20 for formats), followed by another forward slash, and, finally, two or three digits. For example, **240/DAL350010/220** means to fly at 24,000 feet until reaching the fix radial distance represented by DAL350010, and then descend to 22,000 feet. The fix cannot be the arrival or departure point.

21. assignedAlt_08g

This field can have only one value, '**VFR**', for Visual Flight Rules.

22. assignedAlt_08h

This field represents a VFR flight with an altitude. Its format is '**VFR/**' followed by two or three digits showing altitude in hundreds of feet. An example is **VFR/75** meaning the aircraft is flying VFR at 7,500 feet.

23. reportedAlt_54a

This field shows the reported altitude. For aircraft with operative Mode C capability, Field 54a contains the Mode C altitude. For aircraft without Mode C capability or with non-operative Mode C capability, Field 54a may contain the controller-reported altitude. If there is no Mode C or controller-reported altitude, or the reported altitude is negative, Field 54a contains "0" or "000" or is optional. In the field format, one to three digits, is a numeric value between 0 and 999 which represents the aircraft altitude in hundreds of feet. Leading zeros are inserted for altitudes of less than 3 digits.

24. reportedAlt_54b

This field is the reported altitude B4 indicator. The ERAM controllers' full data block used for tracking an aircraft has a special indicator for the B4 character of the full data block. It is one character in length. Possible values are:

- **A** - Reported altitude (controller entered) equals single assigned altitude.
- **B** - Beacon reported altitude is in conformance or the controller-entered reported altitude is in the block for an aircraft which has been assigned an altitude block (B1 to B3 - low altitude limit of block and C1 to C3=high altitude limit of block).
- **C** - Beacon reported altitude is within Altitude Conformance Limits.
- **F** - Reported altitude (controller-entered) equals first altitude, or (beacon-reported) is within the Altitude Conformance Limits of first altitude when assigned altitude is (d)dd/fix/(d)dd and the first altitude is displayed in Field B.
- **N** - No beacon-reported altitude has been received for the aircraft; no controller-entered reported altitude exists for the aircraft; or the aircraft's rate of change is questionable and the Computed Rate of Change is being used to make further conformance checks.
- **T** - Interim altitude is currently being displayed in the assigned altitude field (B1 through B3).
- **V** - Beacon reported or controller entered reported altitude, when no assigned altitude exists for the aircraft.
- **X** - Beacon reported altitude becomes disestablished. (C1-C3 will also contain 'X' character.)
- **^** - Beacon-reported or controller-entered reported altitude is below the assigned altitude when the flight is climbing
- **v** - Beacon-reported or controller-entered reported altitude is above the assigned altitude when the flight is descending
- **+** - Beacon-reported altitude exceeds the upper conformance limit for an aircraft which has reached its assigned altitude, or (for a non-Mode C aircraft which has previously been reported at the assigned altitude) the controller entered reported altitude exceeds the assigned altitude.
- **-** - Beacon reported altitude is less than the lower conformance limit for an aircraft which has reached its assigned altitude or (for a non-Mode C aircraft which has previously been reported at the assigned altitude) the controller entered reported altitude is less than the assigned altitude.
- **/** - Flight type is 'OTP' or 'VFR'

25. reportedAlt_54c

This field is the reported altitude C4 indicator. The ERAM controllers' full data block used for tracking an aircraft has a special indicator for the C4 character of the full data block as follows: If the

aircraft is not responding with the Mode C altitude, the controller entered reported altitude will be displayed in Field C with a pound sign (#) or **X** in position C4 whenever:

- (1) the controller-entered reported altitude does not equal the assigned altitude or is not within the assigned altitude block,
- (2) no assigned altitude has been entered, or
- (3) the assigned altitude is VFR, VFR/(d)dd, OTP, or OTP/(d)dd.

For either a Mode C-reported altitude or a controller-reported altitude, when an interim altitude is displayed in Field B the B4 character position will contain the letter “T” and the reported altitude; otherwise, either the lower or upper altitude of an assigned block altitude will be displayed in Field C. In the case where a controller-entered reported altitude exists, a pound sign (#) or **X** will be displayed in the C4 position. This field is optional.

26. interimAlt_76b

This field is the interim altitude for the flight. Its format is one to three digits, from 0 – 999.

4.1.14 Tentative Aircraft Identification Amendment Information [NI]

The NI message is the Tentative Aircraft Identification Amendment Information Message. It indicates a change to the flight identification field of a tentative flight plan.

The fields in the message are as follows:

1. sourceId_00e

This field is required on all messages sent from ERAM. It contains a time followed by a sequence number. The time is in the format hhmmss, where hh stands for the two-digit hour (00-23), mm for the two-digit minute (00-59), and ss for the two-digit second (00-59). The four-digit sequence number falls in the range 0000-9999.

2. sourceTime_00e1

This field is a breakdown of the first section of **sourceId_00e**. It contains a time in the format hh_mm_ss, where hh stands for the two-digit hour (00-23), mm for the two-digit minute (00-59), and ss for the two-digit second (00-59).

3. sourceSeqNo_00e2

This field is the second part of **sourceId_00e**. It is a sequence number. The four-digit sequence number falls in the range 0000-9999.

4. **flightId_02a**

This field is the Aircraft ID, or flight ID, or Call Sign. It has a variable format, starting with one uppercase alphabetic character, followed by one to six alphanumeric characters. When it is only two characters long, the format is one letter followed by one digit, such as A1 for Air Force One.

5. **computerId_02d**

The computer ID is represented by three alphanumeric characters. The allowed patterns are ddd, ddL, dLd, and dLL. The letters **I** and **O** are prohibited. One special all-alphabetic code may be used, literally **XXX**. This special code is only used in DA (Data Accept) messages in response to an ARTS VFR flight plan input. This field is optional.

6. **sspId_167a**

This field is the Site Specific Plan Identifier. The format is a one- to four-digit string in the range from 0 – 4000. Its value is assigned by Instrument Flight Procedures Automation (IFPA). It is unique for a flight plan in each ERAM facility. This field is optional.

7. **newFlightId_02aN**

This field is the new Aircraft ID, or flight ID (also called Call Sign), that has been changed by the NI message. It has a variable format, starting with one uppercase alphabetic character, followed by one to six alphanumeric characters. When it is only two characters long, the format must be one letter followed by one digit, such as A1 for Air Force One.

8. **newComputerId_02dN**

This field is the new Computer ID that has been changed by the NI message. The computer ID is represented by three alphanumeric characters. The allowed patterns are ddd, ddL, dLd, and dLL. The letters **I** and **O** are prohibited. One special all alphabetic code may be used, literally, **XXX**. This is only used in DA (Data Accept) messages in response to an ARTS VFR flight plan input. This field remains unchanged in the NI message. It is optional.

9. **newSspId_167aN**

This field is the Site Specific Plan Identifier. The format is a one- to four-digit string in a range from 0 – 4000. Its value is assigned by Instrument Flight Procedures Automation (IFPA), and is unique for a system plan in each ERAM facility. This field remains unchanged in the NI message. It is optional.

4.1.15 Tentative Flight Plan Removal [NL]

The NL message is the Tentative Flight Plan Removal Information Message. It indicates a change to the flight identification field of a tentative flight plan.

The fields in the message are as follows:

1. sourceId_00e

This field is required on all messages sent from ERAM. It contains a time followed by a sequence number. The time is in the format hhmmss, where hh stands for the two-digit hour (00-23), mm for the two-digit minute (00-59), and ss for the two-digit second (00-59). The four-digit sequence number falls in the range 0000-9999.

2. sourceTime_00e1

This field is a breakdown of the first section of **sourceId_00e**. It contains a time in the format hh_mm_ss, where hh stands for the two-digit hour (00-23), mm for the two-digit minute (00-59), and ss for the two-digit second (00-59).

3. sourceSeqNo_00e2

This field is the second part of **sourceId_00e**. It is a sequence number. The four-digit sequence number falls in the range 0000-9999.

4. flightId_02a

This field is the Aircraft ID, or flight ID, or Call Sign. It has a variable format, starting with one uppercase alphabetic character, followed by one to six alphanumeric characters. When it is only two characters long, the format is one letter followed by one digit, such as A1 for Air Force One.

5. computerId_02d

The computer ID is represented by three alphanumeric characters. The allowed patterns are ddd, ddL, dLd, and dLL. The letters **I** and **O** are prohibited. One special all-alphabetic code may be used, literally **XXX**. This special code is only used in DA (Data Accept) messages in response to an ARTS VFR flight plan input. This field is optional.

6. sspId_167a

This field is the Site Specific Plan Identifier. The format is a one- to four-digit string in the range from 0 – 4000. Its value is assigned by Instrument Flight Procedures Automation (IFPA). It is unique for a flight plan in each ERAM facility. This field is optional.

7. mergedFPStatus_339a

Contains the tentative flight plan merge status. The merge status is one of the following:

- **N** - deletion without merge – the tentative plan is deleted without merge
- **S*** - merge – an active plan is merged into the tentative flight plan; the flight has the same CID and Site Specific Plan Identifier as the tentative plan

- **D*** - merge – a proposed plan is activated and the tentative flight plan is merged into the activated plan; the flight has the CID and Site Specific Plan Identifier of the activated plan which are different from the tentative plan.

* **Note:** For field value **S**, an FH is sent for the merged flight plan. For value **D**, an AH or DH message is sent for the activated flight plan.

8. **mergedFPComputerId_341a**

Contains the merged flight plan computer ID.

9. **mergedFPSpId_342a**

Contains the merged flight plan site-specific identifier. If the merge is of an active flight into the tentative flight, (339a=**S**), the SSPID will be the same as the tentative. If the merge is due to activation of a proposed flight plan, (339a=**D**), the SSPID will be that of the activated flight plan.

4.1.16 **Tentative Flight Plan Amendment Information [NU]**

The NU message is the Tentative Flight Plan Amendment Information Message. It is sent when a tentative flight plan is amended.

The fields in the message are as follows:

1. **sourceId_00e**

This field is required on all messages sent from ERAM. It contains a time followed by a sequence number. The time is in the format hhmmss, where hh stands for the two-digit hour (00-23), mm for the two-digit minute (00-59), and ss for the two-digit second (00-59). The four-digit sequence number falls in the range 0000-9999.

2. **sourceTime_00e1**

This field is a breakdown of the first section of **sourceId_00e**. It contains a time in the format hh_mm_ss, where hh stands for the two-digit hour (00-23), mm for the two-digit minute (00-59), and ss for the two-digit second (00-59).

3. **sourceSeqNo_00e2**

This field is the second part of **sourceId_00e**. It is a sequence number. The four-digit sequence number falls in the range 0000-9999.

4. **flightId_02a**

This field is the Aircraft ID, or flight ID, or Call Sign. It has a variable format, starting with one uppercase alphabetic character, followed by one to six alphanumeric characters. When it is only two characters long, the format is one letter followed by one digit, such as A1 for Air Force One.

5. **computerId_02d**

The computer ID is represented by three alphanumeric characters. The allowed patterns are ddd, ddL, dLd, and dLL. The letters **I** and **O** are prohibited. One special all-alphabetic code may be used, literally **XXX**. This special code is only used in DA (Data Accept) messages in response to an ARTS VFR flight plan input. This field is optional.

6. **sspId_167a**

This field is the Site Specific Plan Identifier. The format is a one- to four-digit string in the range from 0 – 4000. Its value is assigned by Instrument Flight Procedures Automation (IFPA). It is unique for a flight plan in each ERAM facility. This field is optional.

7. **numberOfAircraft_03a**

This field indicates the number of aircraft for the flight. Its format is one to two digits followed optionally by one uppercase letter to represent the Special Aircraft Indicator. The indicator can also appear on its own, without digits. If no such designator has been assigned, or in case of formation flights comprising more than one type, **ZZZZ** is entered and the (numbers and) type(s) of aircraft are entered in the **TYPIndicator_918h** field. An example of the number of aircraft is a formation of military aircraft flying under one flight plan. An example Special Aircraft Indicator is **H** for Heavy Jet. This field is optional.

8. **typeOfAircraft_03c**

The Type of Aircraft field is one letter followed by one to four alphanumeric characters. Some examples: **B52**, **B747**.

9. **airborneEquip_03e**

This field is the Airborne Equipment Qualifier. It consists of one alphabetic or numeric character. Some sample values are:

- **A** – Transponder with no Mode C
- **B** – Transponder with Mode C
- **E** - Flight Management System (FMS) with DME/DME and IRU position updating
- **G** - Global Navigation Satellite System (GNSS), including GPS or WAAS, with en route and terminal capability

- **X** – No transponder
- **W** – RVSM

This field is optional.

10. beaconCode_04a

The beacon code is represented by four octal digits (i.e., 0-7). When the last two digits of the four digits are zero, the beacon code is a nondiscrete code, a code that is not unique. A discrete, or unique, beacon code is any code not ending in 00. This field is optional. In addition, even if this field were populated in the source message from ERAM, if the enclosing message pertains to a non-active flight, this element will not be present in the version of the message that is sent to non-authorized users by SFDPS.

11. trueAirSpeed_05a

This field is represented in two to four digits, expressing true airspeed in the range 01 – 3700 knots.

12. machSpeed_05c

The mach speed is expressed as three digits with no decimal point, preceded by the letter **M**, up to M500. For example, the speed 0.85 Mach is represented by ‘M085’.

13. classifiedSpeed_05d

This field has a fixed value of **SC**. The adapted classified speed is not displayed on flight strips. The character string ‘SC’ is printed instead.

14. assignedAlt_08a

This field represents an assigned altitude or flight level in hundreds of feet, in two to three digits. Three digits are required for ARTS III. For example, an assigned altitude of 340 means that the aircraft is to fly at 34,000 feet.

Only one of the five altitude fields, 08a through 08e, will appear in a message.

15. assignedAlt_08b

This field has a fixed value of **OTP**, which means the aircraft is flying VFR-On-Top, it is flying above the clouds in VFR conditions.

16. assignedAlt_08c

This field's format is **OTP/**, followed by two to three digits indicating altitude. It represents an IFR flight operating above the clouds in VFR conditions. The sample value **OTP/250** means the aircraft is flying VFR-On-Top at 25,000 feet.

17. assignedAlt_08d

This field is an assigned block of altitudes for the flight to fly. It consists of two to three digits followed by the letter **B**, followed by two to three digits. The digits represent altitude or flight level in hundreds of feet. The lowest altitude is listed first. An example: **80B140**, meaning the flight is assigned an altitude block of 8,000 feet to 14,000 feet.

18. assignedAlt_08e

This field is used for an IFR flight operating above a specified altitude. Its format is **ABV/** followed by two to three digits. An example: **ABV/600**, meaning the flight is flying above 60,000 feet.

19. assignedAlt_08f

This is the assigned altitude a flight will fly at, before, and after a fix. The format is a two to three digit altitude in hundreds of feet followed by a forward slash, a fix specifier (see "coordFix_06a" on page 20 for formats), followed by another forward slash, and, finally, two or three digits. For example, **240/DAL350010/220** means to fly at 24,000 feet until reaching the fix radial distance represented by DAL350010, and then descend to 22,000 feet. The fix cannot be the arrival or departure point.

20. assignedAlt_08g

This field can have only one value, '**VFR**', for Visual Flight Rules.

21. assignedAlt_08h

This field represents a VFR flight with an altitude. Its format is '**VFR/**' followed by two or three digits showing altitude in hundreds of feet. An example is **VFR/75** meaning the aircraft is flying VFR at 7,500 feet.

22. reportedAlt_54a

This field shows the reported altitude. For aircraft with operative Mode C capability, Field 54a contains the Mode C altitude. For aircraft without Mode C capability or with non-operative Mode C capability, Field 54a may contain the controller-reported altitude. If there is no Mode C or controller-reported altitude, or the reported altitude is negative, Field 54a contains "0" or "000" or is optional. In the field format, one to three digits, is a numeric value between 0 and 999 which represents the aircraft altitude in hundreds of feet. Leading zeros are inserted for altitudes of less than 3 digits.

23. reportedAlt_54b

This field is the reported altitude B4 indicator. The ERAM controllers' full data block used for tracking an aircraft has a special indicator for the B4 character of the full data block. It is one character in length. Possible values are:

- **A** - Reported altitude (controller entered) equals single assigned altitude.
- **B** - Beacon reported altitude is in conformance or the controller-entered reported altitude is in the block for an aircraft which has been assigned an altitude block (B1 to B3 - low altitude limit of block and C1 to C3=high altitude limit of block).
- **C** - Beacon reported altitude is within Altitude Conformance Limits.
- **F** - Reported altitude (controller-entered) equals first altitude, or (beacon-reported) is within the Altitude Conformance Limits of first altitude when assigned altitude is (d)dd/fix/(d)dd and the first altitude is displayed in Field B.
- **N** - No beacon-reported altitude has been received for the aircraft; no controller-entered reported altitude exists for the aircraft; or the aircraft's rate of change is questionable and the Computed Rate of Change is being used to make further conformance checks.
- **T** - Interim altitude is currently being displayed in the assigned altitude field (B1 through B3).
- **V** - Beacon reported or controller entered reported altitude, when no assigned altitude exists for the aircraft.
- **X** - Beacon reported altitude becomes disestablished. (C1-C3 will also contain 'X' character.)
- **^** - Beacon-reported or controller-entered reported altitude is below the assigned altitude when the flight is climbing
- **v** - Beacon-reported or controller-entered reported altitude is above the assigned altitude when the flight is descending
- **+** - Beacon-reported altitude exceeds the upper conformance limit for an aircraft which has reached its assigned altitude, or (for a non-Mode C aircraft which has previously been reported at the assigned altitude) the controller entered reported altitude exceeds the assigned altitude.
- **-** - Beacon reported altitude is less than the lower conformance limit for an aircraft which has reached its assigned altitude or (for a non-Mode C aircraft which has previously been reported at the assigned altitude) the controller entered reported altitude is less than the assigned altitude.
- **/** - Flight type is 'OTP' or 'VFR'

24. reportedAlt_54c

This field is the reported altitude C4 indicator. The ERAM controllers' full data block used for tracking an aircraft has a special indicator for the C4 character of the full data block as follows: If the

aircraft is not responding with the Mode C altitude, the controller entered reported altitude will be displayed in Field C with a pound sign (#) or **X** in position C4 whenever:

- (1) the controller-entered reported altitude does not equal the assigned altitude or is not within the assigned altitude block,
- (2) no assigned altitude has been entered, or
- (3) the assigned altitude is VFR, VFR/(d)dd, OTP, or OTP/(d)dd.

For either a Mode C-reported altitude or a controller-reported altitude, when an interim altitude is displayed in Field B the B4 character position will contain the letter “T” and the reported altitude; otherwise, either the lower or upper altitude of an assigned block altitude will be displayed in Field C. In the case where a controller-entered reported altitude exists, a pound sign (#) or **X** will be displayed in the C4 position. This field is optional.

25. interimAlt_76b

This field is the interim altitude for the flight. Its format is one to three digits, from 0 – 999.

4.1.17 Track Information [TH]

The TH is the Track Information message. It contains track updates for individual flights. A number of flight track updates are included in each TH message from ERAM. In FDPS, they are broken out by flight, with just one track update per message.

The fields in the message are as follows:

1. sourceId_00e

This field is required on all messages sent from ERAM. It contains a time followed by a sequence number. The time is in the format hhmmss, where hh stands for the two-digit hour (00-23), mm for the two-digit minute (00-59), and ss for the two-digit second (00-59). The four-digit sequence number falls in the range 0000-9999.

2. sourceTime_00e1

This field is a breakdown of the first section of **sourceId_00e**. It contains a time in the format hh_mm_ss, where hh stands for the two-digit hour (00-23), mm for the two-digit minute (00-59), and ss for the two-digit second (00-59).

3. .sourceSeqNo_00e2

This field is the second part of **sourceId_00e**. It is a sequence number. The four-digit sequence number falls in the range 0000-9999.

4. **flightId_02a**

This field is the Aircraft ID, or flight ID, or Call Sign. It has a variable format, starting with one uppercase alphabetic character, followed by one to six alphanumeric characters. When it is only two characters long, the format is one letter followed by one digit, such as A1 for Air Force One.

5. **computerId_02d**

The computer ID is represented by three alphanumeric characters. The allowed patterns are ddd, ddL, dLd, and dLL. The letters **I** and **O** are prohibited. One special all-alphabetic code may be used, literally **XXX**. This special code is only used in DA (Data Accept) messages in response to an ARTS VFR flight plan input. This field is optional.

6. **sspId_167a**

This field is the Site Specific Plan Identifier. The format is a one- to four-digit string in the range from 0 – 4000. Its value is assigned by Instrument Flight Procedures Automation (IFPA). It is unique for a flight plan in each ERAM facility. This field is optional.

7. **groundSpeed_05b**

This field is the ground speed in knots, in the form of three digits. Sample: 357.

8. **assignedAlt_08a**

This field represents an assigned altitude or flight level in hundreds of feet, in two to three digits. Three digits are required for ARTS III. For example, an assigned altitude of 340 means that the aircraft is to fly at 34,000 feet.

Only one of the five altitude fields, 08a through 08e, will appear in a message.

9. **assignedAlt_08b**

This field has a fixed value of **OTP**, which means the aircraft is flying VFR-On-Top, it is flying above the clouds in VFR conditions.

10. **assignedAlt_08c**

This field's format is **OTP/**, followed by two to three digits indicating altitude. It represents an IFR flight operating above the clouds in VFR conditions. The sample value **OTP/250** means the aircraft is flying VFR-On-Top at 25,000 feet.

11. **Error! Bookmark not defined.assignedAlt_08d**

This field is an assigned block of altitudes for the flight to fly. It consists of two to three digits followed by the letter **B**, followed by two to three digits. The digits represent altitude or flight level in

hundreds of feet. The lowest altitude is listed first. An example: **80B140**, meaning the flight is assigned an altitude block of 8,000 feet to 14,000 feet.

12. assignedAlt_08e

This field is used for an IFR flight operating above a specified altitude. Its format is **ABV/** followed by two to three digits. An example: **ABV/600**, meaning the flight is flying above 60,000 feet.

13. assignedAlt_08f

This is the assigned altitude a flight will fly at, before, and after a fix. The format is a two to three digit altitude in hundreds of feet followed by a forward slash, a fix specifier (see "coordFix_06a" on page 20 for formats), followed by another forward slash, and, finally, two or three digits. For example, **240/DAL350010/220** means to fly at 24,000 feet until reaching the fix radial distance represented by DAL350010, and then descend to 22,000 feet. The fix cannot be the arrival or departure point.

14. assignedAlt_08g

This field can have only one value, '**VFR**', for Visual Flight Rules.

15. assignedAlt_08h

This field represents a VFR flight with an altitude. Its format is '**VFR/**' followed by two or three digits showing altitude in hundreds of feet. An example is **VFR/75** meaning the aircraft is flying VFR at 7,500 feet.

16. reportedAlt_54a

This field shows the reported altitude. For aircraft with operative Mode C capability, Field 54a contains the Mode C altitude. For aircraft without Mode C capability or with non-operative Mode C capability, Field 54a may contain the controller-reported altitude. If there is no Mode C or controller-reported altitude, or the reported altitude is negative, Field 54a contains "0" or "000" or is optional. In the field format, one to three digits, is a numeric value between 0 and 999 which represents the aircraft altitude in hundreds of feet. Leading zeros are inserted for altitudes of less than 3 digits.

17. reportedAlt_54b

This field is the reported altitude B4 indicator. The ERAM controllers' full data block used for tracking an aircraft has a special indicator for the B4 character of the full data block. It is one character in length. Possible values are:

- **A** - Reported altitude (controller entered) equals single assigned altitude.

- **B** - Beacon reported altitude is in conformance or the controller-entered reported altitude is in the block for an aircraft which has been assigned an altitude block (B1 to B3 - low altitude limit of block and C1 to C3=high altitude limit of block).
- **C** - Beacon reported altitude is within Altitude Conformance Limits.
- **F** - Reported altitude (controller-entered) equals first altitude, or (beacon-reported) is within the Altitude Conformance Limits of first altitude when assigned altitude is (d)dd/fix/(d)dd and the first altitude is displayed in Field B.
- **N** - No beacon-reported altitude has been received for the aircraft; no controller-entered reported altitude exists for the aircraft; or the aircraft's rate of change is questionable and the Computed Rate of Change is being used to make further conformance checks.
- **T** - Interim altitude is currently being displayed in the assigned altitude field (B1 through B3).
- **V** - Beacon reported or controller entered reported altitude, when no assigned altitude exists for the aircraft.
- **X** - Beacon reported altitude becomes disestablished. (C1-C3 will also contain 'X' character.)
- **^** - Beacon-reported or controller-entered reported altitude is below the assigned altitude when the flight is climbing
- **v** - Beacon-reported or controller-entered reported altitude is above the assigned altitude when the flight is descending
- **+** - Beacon-reported altitude exceeds the upper conformance limit for an aircraft which has reached its assigned altitude, or (for a non-Mode C aircraft which has previously been reported at the assigned altitude) the controller entered reported altitude exceeds the assigned altitude.
- **-** - Beacon reported altitude is less than the lower conformance limit for an aircraft which has reached its assigned altitude or (for a non-Mode C aircraft which has previously been reported at the assigned altitude) the controller entered reported altitude is less than the assigned altitude.
- **/** - Flight type is 'OTP' or 'VFR'

18. reportedAlt_54c

This field is the reported altitude C4 indicator. The ERAM controllers' full data block used for tracking an aircraft has a special indicator for the C4 character of the full data block as follows: If the aircraft is not responding with the Mode C altitude, the controller entered reported altitude will be displayed in Field C with a pound sign (#) or **X** in position C4 whenever:

- (1) the controller-entered reported altitude does not equal the assigned altitude or is not within the assigned altitude block,
- (2) no assigned altitude has been entered, or
- (3) the assigned altitude is VFR, VFR/(d)dd, OTP, or OTP/(d)dd.

For either a Mode C-reported altitude or a controller-reported altitude, when an interim altitude is displayed in Field B the B4 character position will contain the letter “T” and the reported altitude; otherwise, either the lower or upper altitude of an assigned block altitude will be displayed in Field C. In the case where a controller-entered reported altitude exists, a pound sign (#) or **X** will be displayed in the C4 position. This field is optional.

19. controllingFacility_138a

This field shows the facility that is controlling the flight. Its format is three letters. An example: **ZCH**. This field is optional.

20. controllingSector_138b

This field shows the controlling ARTS position or the controlling ERAM ARTCC sector number. The Controlling Sector is the sector/position that is controlling the flight. The value will be **00** if identification of the controlling sector is not available. The format is one digit followed by one alphanumeric. For example: **1W**. This field is optional.

21. receivingFacility_139a

This field shows the facility that is receiving the flight. Its format is three letters. An example: **AIA**.

22. receivingSector_139b

This field shows the receiving ARTS position or the receiving ERAM ARTCC sector number. The receiving sector is the sector/position that is receiving the flight. The value will be **00** if identification of the receiving sector is not available. The format is one digit followed by one alphanumeric. For example: **1W**.

23. trackPosition_23d

This field shows the track position from ERAM to ATM-IPOP. It is a latitude/longitude pair, separated by a virgule, in the format ddddddL/dddLdddL. For latitude, the first two digits are degrees, the second two are minutes, and the last two are seconds. The letter can be **N** or **S**. For the longitude, the first three digits are degrees, the second two are minutes, and the last two are seconds. The letter can be **E** or **W**. Example: **393106N/0842535W**.

24. trackVelocity_23e

This field shows the velocity and/or heading in nautical miles per hour. It has an **X** and a **Y** component separated by a forward slash. Either component can be preceded by either a + or – sign, followed by one to three digits. The second component can be preceded by an **S** or an **H**, for speed only (NM/hr), or heading only (degrees), respectively. Some examples: **+46/-355**, **-0/S439**.

25. coastIndicator_153a

This field is an action indicator. It has only one possible value, **C** for Coast. This field is optional.

26. timeOfTrackData_170a

This field is the date and time the track data was stored. It is saved in XML standard dateTime format. This field is optional.

27. targetPosition_171a

This field is the ERAM radar target position, in latitude/longitude format. This field is optional.

28. targetAlt_172a

This field is the Mode C target altitude (corrected for barometric pressure) in hundreds of feet. Its format is three digits, with leading zeros required. If the target altitude is negative, 172a will be 000. Example: 290. This field is optional.

29. targetAltInvalid_172b

If field targetAlt_172a is not valid, this field is set to INV. This field is optional.

30. timeOfTargetData_173a

This field is the date and time of the correlated target. It is saved in XML standard dateTime format. This field is optional.

4.1.18 Drop Track Information [RH]

The RH message is the Drop Track Information Message. It provides data to indicate the discontinued tracking of a particular flight as it flies out of the NAS or into another ARTCC.

The fields in the message are as follows:

1. sourceId_00e

This field is required on all messages sent from ERAM. It contains a time followed by a sequence number. The time is in the format hhmmss, where hh stands for the two-digit hour (00-23), mm for the two-digit minute (00-59), and ss for the two-digit second (00-59). The four-digit sequence number falls in the range 0000-9999.

2. **sourceTime_00e1**

This field is a breakdown of the first section of **sourceId_00e**. It contains a time in the format hh_mm_ss, where hh stands for the two-digit hour (00-23), mm for the two-digit minute (00-59), and ss for the two-digit second (00-59).

3. **sourceSeqNo_00e2**

This field is the second part of **sourceId_00e**. It is a sequence number. The four-digit sequence number falls in the range 0000-9999.

4. **flightId_02a**

This field is the Aircraft ID, or flight ID, or Call Sign. It has a variable format, starting with one uppercase alphabetic character, followed by one to six alphanumeric characters. When it is only two characters long, the format is one letter followed by one digit, such as A1 for Air Force One.

5. **computerId_02d**

The computer ID is represented by three alphanumeric characters. The allowed patterns are ddd, ddL, dLd, and dLL. The letters **I** and **O** are prohibited. One special all-alphabetic code may be used, literally **XXX**. This special code is only used in DA (Data Accept) messages in response to an ARTS VFR flight plan input. This field is optional.

6. **sspId_167a**

This field is the Site Specific Plan Identifier. The format is a one- to four-digit string in the range from 0 – 4000. Its value is assigned by Instrument Flight Procedures Automation (IFPA). It is unique for a flight plan in each ERAM facility. This field is optional.

4.1.19 Interim Altitude Information [LH]

The LH message is the Interim Altitude Information Message. It provides interim altitude data for a flight. The fields in the message are as follows:

1. **sourceId_00e**

This field is required on all messages sent from ERAM. It contains a time followed by a sequence number. The time is in the format hhmmss, where hh stands for the two-digit hour (00-23), mm for the two-digit minute (00-59), and ss for the two-digit second (00-59). The four-digit sequence number falls in the range 0000-9999.

2. **sourceTime_00e1**

This field is a breakdown of the first section of **sourceId_00e**. It contains a time in the format hh_mm_ss, where hh stands for the two-digit hour (00-23), mm for the two-digit minute (00-59), and ss for the two-digit second (00-59).

3. **sourceSeqNo_00e2**

This field is the second part of **sourceId_00e**. It is a sequence number. The four-digit sequence number falls in the range 0000-9999.

4. **interimAlt_76a**

Contains the letter D that is used to delete the interim altitude stored by ATM-IPOP.

5. **interimAlt_76b**

This field is the interim altitude for the flight. Its format is one to three digits, from 0 – 999.

6. **flightId_02a**

This field is the Aircraft ID, or flight ID, or Call Sign. It has a variable format, starting with one uppercase alphabetic character, followed by one to six alphanumeric characters. When it is only two characters long, the format is one letter followed by one digit, such as A1 for Air Force One.

7. **computerId_02d**

The computer ID is represented by three alphanumeric characters. The allowed patterns are ddd, ddL, dLd, and dLL. The letters **I** and **O** are prohibited. One special all-alphabetic code may be used, literally **XXX**. This special code is only used in DA (Data Accept) messages in response to an ARTS VFR flight plan input. This field is optional.

8. **sspId_167a**

This field is the Site Specific Plan Identifier. The format is a one- to four-digit string in the range from 0 – 4000. Its value is assigned by Instrument Flight Procedures Automation (IFPA). It is unique for a flight plan in each ERAM facility. This field is optional.

4.1.20 **ARTS Flow Control Track/Full Data Block Information [HZ]**

The HZ message is the Automated Terminal Radar System (ARTS) Flow Control Track/Full Data Block Information Message.

The fields in the message are as follows:

1. sourceId_00e

This field is required on all messages sent from ERAM. It contains a time followed by a sequence number. The time is in the format hhmmss, where hh stands for the two-digit hour (00-23), mm for the two-digit minute (00-59), and ss for the two-digit second (00-59). The four-digit sequence number falls in the range 0000-9999.

2. sourceTime_00e1

This field is a breakdown of the first section of **sourceId_00e**. It contains a time in the format hh_mm_ss, where hh stands for the two-digit hour (00-23), mm for the two-digit minute (00-59), and ss for the two-digit second (00-59).

3. sourceSeqNo_00e2

This field is the second part of **sourceId_00e**. It is a sequence number. The four-digit sequence number falls in the range 0000-9999.

4. addresseeARTS_00d

Contains the ARTS facility identification to which ERAM is to relay the message.

5. addresserARTS_00a

Contains the ARTS facility identification from which ERAM is to relay the message.

6. flightId_02a

This field is the Aircraft ID, or flight ID, or Call Sign. It has a variable format, starting with one uppercase alphabetic character, followed by one to six alphanumeric characters. When it is only two characters long, the format is one letter followed by one digit, such as A1 for Air Force One.

7. computerId_02d

The computer ID is represented by three alphanumeric characters. The allowed patterns are ddd, ddL, dLd, and dLL. The letters **I** and **O** are prohibited. One special all-alphabetic code may be used, literally **XXX**. This special code is only used in DA (Data Accept) messages in response to an ARTS VFR flight plan input. This field is optional.

8. groundSpeed_05b

This field is the ground speed in knots, in the form of three digits. Sample: 357.

9. **assignedAlt_08a**

This field represents an assigned altitude or flight level in hundreds of feet, in two to three digits. Three digits are required for ARTS III. For example, an assigned altitude of 340 means that the aircraft is to fly at 34,000 feet.

Only one of the five altitude fields (this and the following four) will be included in a message.

10. **assignedAlt_08c**

This field's format is **OTP**/, followed by two to three digits. It represents an IFR flight operating above the clouds in VFR conditions. The sample value **OTP/250** means the aircraft is flying VFR-ON-Top at 25,000 feet.

11. **interimAlt_76b**

This field is the interim altitude for the flight. Its format is one to three digits, from 0 – 999.

12. **assignedAlt_08d**

This field is an assigned block of altitudes for the flight to fly. It consists of two to three digits followed by the letter **B**, followed by two to three digits. The digits represent altitude or flight level in hundreds of feet. The lowest altitude must be listed first. An example: **80B140**.

13. **reportedAlt_54aC**

This field shows the reported Mode C altitude. Field 54aC contains "0" or "000". In the field format, one to three digits, is a numeric value between 0 and 999 which represents the aircraft altitude in hundreds of feet. Leading zeros may be inserted for altitudes of less than 3 digits.

14. **trackPosition_23d**

This field shows the track position form ERAM to ATM-IPOP. It is a latitude/longitude pair, separated by a virgule, in the format ddddddL/dddLdddL. For latitude, the first two digits are degrees, the second two are minutes, and the last two are seconds. The letter can be **N** or **S**. For the longitude, the first three digits are degrees, the second two are minutes, and the last two are seconds. The letter can be **E** or **W**. Example: **393106N/0842535W**.

4.1.21 **Beacon Code Reassignment[BA]**

The BA message is the Beacon Code Reassignment Information message. It is used to provide updated beacon code reassignment information when ERAM determines that an automatic beacon code reassignment occurred because the requested beacon code was already in use by another aircraft. This

message is only shared with consumers explicitly authorized to receive this information when it pertains to a non-active flight (i.e., in this case, the FDPS_Restricted property will have the value 'R').

The fields in the message are as follows:

1. sourceId_00e

This field is required on all messages sent from ERAM. It contains a time followed by a sequence number. The time is in the format hhmmss, where hh stands for the two-digit hour (00-23), mm for the two-digit minute (00-59), and ss for the two-digit second (00-59). The four-digit sequence number falls in the range 0000-9999.

2. sourceTime_00e1

This field is a breakdown of the first section of **sourceId_00e**. It contains a time in the format hh_mm_ss, where hh stands for the two-digit hour (00-23), mm for the two-digit minute (00-59), and ss for the two-digit second (00-59).

3. sourceSeqNo_00e2

This field is the second part of **sourceId_00e**. It is a sequence number. The four-digit sequence number falls in the range 0000-9999.

4. flightId_02a

This field is the Aircraft ID, or flight ID, or Call Sign. It has a variable format, starting with one uppercase alphabetic character, followed by one to six alphanumeric characters. When it is only two characters long, the format is one letter followed by one digit, such as A1 for Air Force One.

5. computerId_02d

The computer ID is represented by three alphanumeric characters. The allowed patterns are ddd, ddL, dLd, and dLL. The letters **I** and **O** are prohibited. One special all-alphabetic code may be used, literally **XXX**. This special code is only used in DA (Data Accept) messages in response to an ARTS VFR flight plan input. This field is optional.

6. eramGufi_316a

This field is a unique ID for each flight plan in the system.

The format consists of:

- ICAO country code, one letter
- en route facility ID, one letter
- time in seconds of current day, five digits (00000 – 86400)
- day of week, one digit (1-7)

- sequence number, two digits

The following fields are related to internal processing for the field **eramGufi_316a**:

- **eramGufi_316a0, eramGufi_316aNum, eramGufi_316aFPId**
Format: ICAO country code, one letter, en route facility ID, one letter; followed by time in seconds of current day, five digits (00000 – 86400), day of week, one digit (1-7), sequence number, two digits.
- **eramGufi_316aDT**
Format: yyyy-mm-dd T hh:mm:ss Z, followed by one or more digit

This field is optional.

7. **sspId_167a**

This field is the Site Specific Plan Identifier. The format is a one- to four-digit string in the range from 0 – 4000. Its value is assigned by Instrument Flight Procedures Automation (IFPA). It is unique for a flight plan in each ERAM facility. This field is optional.

8. **beaconCode_04a**

The beacon code is represented by four octal digits (i.e., 0-7). When the last two digits of the four digits are zero, the beacon code is a nondiscrete code, a code that is not unique. A discrete, or unique, beacon code is any code not ending in 00. This field is optional.

9. **departurePoint_26a**

The departure point is the point at which to start processing a flight plan. Any of the allowed ways to represent a fix can be used in this field, including the standard airport designators. A fix name, lat/long, or fix-radial-distance can also be used. Some examples are: **AB, DFW, KDFW, SHP090015, 3500N/04000W**.

10. **destination_27a**

The destination is the point at which to end processing a flight plan. Any of the allowed ways to represent a fix can be used in this field, including the standard airport designators. A fix name, lat/long, or fix-radial-distance can also be used. Some examples are: **AB, DFW, KDFW, SHP090015, 3500N/04000W**.

4.1.22 **Beacon Code Restricted [RE]**

The RE message is the Beacon Code Restricted Information message. It is used to provide updated beacon code reassignment information when ERAM determines that an automatic beacon code reassignment occurred because the requested beacon code is adapted as restricted. This message is only

shared with consumers explicitly authorized to receive this information when it pertains to a non-active flight (i.e., in this case, the FDPS_Restricted property will have the value 'R').

The fields in the message are as follows:

1. sourceId_00e

This field is required on all messages sent from ERAM. It contains a time followed by a sequence number. The time is in the format hhmmss, where hh stands for the two-digit hour (00-23), mm for the two-digit minute (00-59), and ss for the two-digit second (00-59). The four-digit sequence number falls in the range 0000-9999.

2. sourceTime_00e1

This field is a breakdown of the first section of **sourceId_00e**. It contains a time in the format hh_mm_ss, where hh stands for the two-digit hour (00-23), mm for the two-digit minute (00-59), and ss for the two-digit second (00-59).

3. sourceSeqNo_00e2

This field is the second part of **sourceId_00e**. It is a sequence number. The four-digit sequence number falls in the range 0000-9999.

4. flightId_02a

This field is the Aircraft ID, or flight ID, or Call Sign. It has a variable format, starting with one uppercase alphabetic character, followed by one to six alphanumeric characters. When it is only two characters long, the format is one letter followed by one digit, such as A1 for Air Force One.

5. computerId_02d

The computer ID is represented by three alphanumeric characters. The allowed patterns are ddd, ddL, dLd, and dLL. The letters **I** and **O** are prohibited. One special all-alphabetic code may be used, literally **XXX**. This special code is only used in DA (Data Accept) messages in response to an ARTS VFR flight plan input. This field is optional.

6. eramGufi_316a

This field is a unique ID for each flight plan in the system.

The format consists of:

- ICAO country code, one letter
- en route facility ID, one letter
- time in seconds of current day, five digits (00000 – 86400)

- day of week, one digit (1-7)
- sequence number, two digits

The following fields are related to internal processing for the field **eramGufi_316a**:

- **eramGufi_316a0, eramGufi_316aNum, eramGufi_316aFPId**
Format: ICAO country code, one letter, en route facility ID, one letter; followed by time in seconds of current day, five digits (00000 – 86400), day of week, one digit (1-7), sequence number, two digits.
- **eramGufi_316aDT**
Format: yyyy-mm-dd T hh:mm:ss Z, followed by one or more digit

This field is optional.

7. **sspId_167a**

This field is the Site Specific Plan Identifier. The format is a one- to four-digit string in the range from 0 – 4000. Its value is assigned by Instrument Flight Procedures Automation (IFPA). It is unique for a flight plan in each ERAM facility. This field is optional.

8. **beaconCode_04a**

The beacon code is represented by four octal digits (i.e., 0-7). When the last two digits of the four digits are zero, the beacon code is a nondiscrete code, a code that is not unique. A discrete, or unique, beacon code is any code not ending in 00. This field is optional.

9. **departurePoint_26a**

The departure point is the point at which to start processing a flight plan. Any of the allowed ways to represent a fix can be used in this field, including the standard airport designators. A fix name, lat/long, or fix-radial-distance can also be used. Some examples are: **AB, DFW, KDFW, SHP090015, 3500N/04000W**.

10. **destination_27a**

The destination is the point at which to end processing a flight plan. Any of the allowed ways to represent a fix can be used in this field, including the standard airport designators. A fix name, lat/long, or fix-radial-distance can also be used. Some examples are: **AB, DFW, KDFW, SHP090015, 3500N/04000W**.

11. **restrictedBeaconCode_04aR**

The restricted beacon code is represented by four octal digits (i.e., 0-7). When the last two digits of the four digits are zero, the beacon code is a nondiscrete code. A discrete beacon code is any code not

ending in 00.

4.1.23 FDB Fourth Line Information [HF]

The HF message is the Full Data Block (FDB) Fourth Line Information message. It provides displayable, user-specified FDB fourth line data stored in ERAM, -- i.e., heading, speed or free form text, -- when this data is created, changed or deleted.

The fields in the message are as follows:

1. sourceId_00e

This field is required on all messages sent from ERAM. It contains a time followed by a sequence number. The time is in the format hhmmss, where hh stands for the two-digit hour (00-23), mm for the two-digit minute (00-59), and ss for the two-digit second (00-59). The four-digit sequence number falls in the range 0000-9999.

2. sourceTime_00e1

This field is a breakdown of the first section of **sourceId_00e**. It contains a time in the format hh_mm_ss, where hh stands for the two-digit hour (00-23), mm for the two-digit minute (00-59), and ss for the two-digit second (00-59).

3. sourceSeqNo_00e2

This field is the second part of **sourceId_00e**. It is a sequence number. The four-digit sequence number falls in the range 0000-9999.

4. flightId_02a

This field is the Aircraft ID, or flight ID, or Call Sign. It has a variable format, starting with one uppercase alphabetic character, followed by one to six alphanumeric characters. When it is only two characters long, the format is one letter followed by one digit, such as A1 for Air Force One.

5. computerId_02d

The computer ID is represented by three alphanumeric characters. The allowed patterns are ddd, ddL, dLd, and dLL. The letters **I** and **O** are prohibited. One special all-alphabetic code may be used, literally **XXX**. This special code is only used in DA (Data Accept) messages in response to an ARTS VFR flight plan input. This field is optional.

6. **sspId_167a**

This field is the Site Specific Plan Identifier. The format is a one- to four-digit string in the range from 0 – 4000. Its value is assigned by Instrument Flight Procedures Automation (IFPA). It is unique for a flight plan in each ERAM facility. This field is optional.

7. **FDB4thLineHeading_155a**

This field displays the heading of the aircraft issued by the controller. Its format is one to four alphanumeric characters. Samples: 075, H075.

8. **FDB4thLineSpeed_155b**

This field is used to display the speed of the aircraft issued by the controller. Valid formats are:

In Knots:

ddd

ddd+

ddd–

+d(d)

–d(d)

Sddd

In MACH:

dd

dd+

.dd–

M(d)dd

Mdd+

Mdd–

.dd

M.dd

.dd+

dd–

Other:

PS

+–

Some examples: **280+**, **S260**, **M83+**, **.75–**.

9. FDB4thLineText_155c

This field is used to display free-form text issued by the controller. It can be one to eight characters long. The allowed characters are the alphanumerics, -, +, =, *, /, underscore (_), semicolon (;), period (.), and comma (,). No leading or embedded spaces are allowed. Some examples: **BLVNS**, **-BUFFI**.

4.1.24 Point Out Information [HT]

The HT message is the Point Out Information message. It is used to provide interfacility and intrafacility point out information when these actions occur.

The fields in the message are as follows:

1. sourceId_00e

This field is required on all messages sent from ERAM. It contains a time followed by a sequence number. The time is in the format hhmmss, where hh stands for the two-digit hour (00-23), mm for the two-digit minute (00-59), and ss for the two-digit second (00-59). The four-digit sequence number falls in the range 0000-9999.

2. sourceTime_00e1

This field is a breakdown of the first section of **sourceId_00e**. It contains a time in the format hh_mm_ss, where hh stands for the two-digit hour (00-23), mm for the two-digit minute (00-59), and ss for the two-digit second (00-59).

3. sourceSeqNo_00e2

This field is the second part of **sourceId_00e**. It is a sequence number. The four-digit sequence number falls in the range 0000-9999.

4. flightId_02a

This field is the Aircraft ID, or flight ID, or Call Sign. It has a variable format, starting with one uppercase alphabetic character, followed by one to six alphanumeric characters. When it is only two characters long, the format is one letter followed by one digit, such as A1 for Air Force One.

5. computerId_02d

The computer ID is represented by three alphanumeric characters. The allowed patterns are ddd, ddL, dLd, and dLL. The letters **I** and **O** are prohibited. One special all-alphabetic code may be used, literally **XXX**. This special code is only used in DA (Data Accept) messages in response to an ARTS VFR flight plan input. This field is optional.

6. **sspId_167a**

This field is the Site Specific Plan Identifier. The format is a one- to four-digit string in the range from 0 – 4000. Its value is assigned by Instrument Flight Procedures Automation (IFPA). It is unique for a flight plan in each ERAM facility. This field is optional.

7. **sourceSectorRouting_134b**

This field provides the entering sector number for a Point Out action. Its format is two digits, from 00 – 99.

8. **targetSector_16g**

This field specifies an adjacent center sector number for that center or an internal ERAM sector number. The format is an optional letter to specify the center, followed by two digits to specify the sector. Examples: **M45, 80**.

4.1.25 Inbound Point Out Information [PT]

The PT is the Inbound Point Out Information message. It is sent from ERAM upon receipt of an interfacility pointout message from another center.

The fields in the message are as follows:

1. **sourceId_00e**

This field is required on all messages sent from ERAM. It contains a time followed by a sequence number. The time is in the format hhmmss, where hh stands for the two-digit hour (00-23), mm for the two-digit minute (00-59), and ss for the two-digit second (00-59). The four-digit sequence number falls in the range 0000-9999.

2. **sourceTime_00e1**

This field is a breakdown of the first section of **sourceId_00e**. It contains a time in the format hh_mm_ss, where hh stands for the two-digit hour (00-23), mm for the two-digit minute (00-59), and ss for the two-digit second (00-59).

3. **sourceSeqNo_00e2**

This field is the second part of **sourceId_00e**. It is a sequence number. The four-digit sequence number falls in the range 0000-9999.

4. **flightId_02a**

This field is the Aircraft ID, or flight ID, or Call Sign. It has a variable format, starting with one uppercase alphabetic character, followed by one to six alphanumeric characters. When it is only two characters long, the format is one letter followed by one digit, such as A1 for Air Force One.

5. **computerId_02d**

The computer ID is represented by three alphanumeric characters. The allowed patterns are ddd, ddL, dLd, and dLL. The letters **I** and **O** are prohibited. One special all-alphabetic code may be used, literally **XXX**. This special code is only used in DA (Data Accept) messages in response to an ARTS VFR flight plan input. This field is optional.

6. **sspId_167a**

This field is the Site Specific Plan Identifier. The format is a one- to four-digit string in the range from 0 – 4000. Its value is assigned by Instrument Flight Procedures Automation (IFPA). It is unique for a flight plan in each ERAM facility. This field is optional.

7. **controllingFacility_138a**

This field shows the facility that is controlling the flight. Its format is three letters. An example: **ZCH**. This field is optional.

8. **receivingFacility_139a**

This field shows the facility that is receiving the flight. Its format is three letters. An example: **AIA**.

9. **receivingSector_139b**

This field shows the receiving ARTS position or the receiving ERAM ARTCC sector number. The receiving sector is the sector/position that is receiving the flight. The value will be **00** if identification of the receiving sector is not available. The format is one digit followed by one alphanumeric. For example: **1W**.

4.1.26 **Hand Off Status [OH]**

The OH is the Handoff Status message. It is sent when a handoff is initiated, accepted, control is taken away (assert control), or retracted, or when the failure of handoff is detected.

The fields in the message are as follows:

1. **sourceId_00e**

This field is required on all messages sent from ERAM. It contains a time followed by a sequence number. The time is in the format hhmmss, where hh stands for the two-digit hour (00-23), mm for the two-digit minute (00-59), and ss for the two-digit second (00-59). The four-digit sequence number falls in the range 0000-9999.

2. sourceTime_00e1

This field is a breakdown of the first section of **sourceId_00e**. It contains a time in the format hh_mm_ss, where hh stands for the two-digit hour (00-23), mm for the two-digit minute (00-59), and ss for the two-digit second (00-59).

3. sourceSeqNo_00e2

This field is the second part of **sourceId_00e**. It is a sequence number. The four-digit sequence number falls in the range 0000-9999.

4. flightId_02a

This field is the Aircraft ID, or flight ID, or Call Sign. It has a variable format, starting with one uppercase alphabetic character, followed by one to six alphanumeric characters. When it is only two characters long, the format is one letter followed by one digit, such as A1 for Air Force One.

5. computerId_02d

The computer ID is represented by three alphanumeric characters. The allowed patterns are ddd, ddL, dLd, and dLL. The letters **I** and **O** are prohibited. One special all-alphabetic code may be used, literally **XXX**. This special code is only used in DA (Data Accept) messages in response to an ARTS VFR flight plan input. This field is optional.

6. sspId_167a

This field is the Site Specific Plan Identifier. The format is a one- to four-digit string in the range from 0 – 4000. Its value is assigned by Instrument Flight Procedures Automation (IFPA). It is unique for a flight plan in each ERAM facility. This field is optional.

7. controllingFacility_138a

This field shows the facility that is controlling the flight. Its format is three letters. An example: **ZCH**. This field is optional.

8. controllingSector_138b

This field shows the controlling ARTS position or the controlling ERAM ARTCC sector number. The Controlling Sector is the sector/position that is controlling the flight. The value will be **00** if

identification of the controlling sector is not available. The format is one digit followed by one alphanumeric. For example: **1W**. This field is optional.

9. receivingFacility_139a

This field shows the facility that is receiving the flight. Its format is three letters. An example: **AIA**.

10. receivingSector_139b

This field shows the receiving ARTS position or the receiving ERAM ARTCC sector number. The receiving sector is the sector/position that is receiving the flight. The value will be **00** if identification of the receiving sector is not available. The format is one digit followed by one alphanumeric. For example: **1W**.

11. acceptingFacility_334a

Contains the accepting facility identifier. The accepting facility is the facility receiving the flight when the handoff was initiated. Data in this field indicate that a handoff is accepted. Its format is three letters. Example: **ZCA**.

12. acceptingSector_335a

Contains the accepting sector data. The accepting sector is the receiving sector/position that accepts the flight in handoff status. Field 335a is the same as field 139b. The format is one digit followed by one alphanumeric. For example: **1B, 49**.

13. handoffEventIndicator_336a

Contains the handoff event indicator. The possible values and their meanings are:

- **I** – initiation
- **A** – acceptance
- **R** – retraction
- **T** – take control
- **U** – update
- **F** – failure

4.2 Airspace Data Messages Details

4.2.1 Sector Assignment Status [SH]

The SH is the Sector Assignment Status message. It provides current sector assignment data for all adapted sectors in the ARTCC.

An SH is defined by either an indicator that the sector or TRACON is closed, or one or more FAV numbers that currently compose that sector. Sectors are identified by a two-digit number, TRACONs are identified by a three-character alphanumeric, and FAVs are identified by a four-digit number. Closed status is indicated by a dash (-). For example, the following defines the assignment status for a sector that is closed:

Sector (29a): 02

No FAV Indicator (29c):-

The following defines the assignment status for a sector that is composed of three FAVs:

Sector (29a): 03

FAV (29d): 0301

FAV (29d): 0302

FAV (29d): 0201

The TRACON information is formatted in the same way, with **traconNoFAV indicators (29h)** and **traconFAVAssignments** listing **traconFAV (29i)** four-digit codes. ERAM generates an SH when an assignment at a center changes, or when reconstituting data. A single SH contains only sector assignments for one center, and always includes every sector for that center.

The fields in the message are as follows:

1. **sourceId_00e**

This field is required on all messages sent from ERAM. It contains a time followed by a sequence number. The time is in the format hhmmss, where hh stands for the two-digit hour (00-23), mm for the two-digit minute (00-59), and ss for the two-digit second (00-59). The four-digit sequence number falls in the range 0000-9999.

2. **sourceTime_00e1**

This field is a breakdown of the first section of **sourceId_00e**. It contains a time in the format hh_mm_ss, where hh stands for the two-digit hour (00-23), mm for the two-digit minute (00-59), and ss for the two-digit second (00-59).

3. **sourceSeqNo_00e2**

This field is the second part of **sourceId_00e**. It is a sequence number. The four-digit sequence number falls in the range 0000-9999.

4. **sector**

This field is used to group the following fields: **sector_29a**, **noFAV_29c**, **FAVAssignments**, and grouped under **FAVAssignments**, **FAV_29d**. Each sector element can have one **sector_29a**, followed by either a **noFAV_29c** field or a **FAVAssignments** group. The sector grouping can appear from one to one hundred times.

5. **sector_29a**

This field is the sector identifier, for which the following FAV data applies. It is a two-digit field. For example: **29**.

6. **noFAV_29c**

When this field appears, it indicates that there is no FAV assignment for this sector. If this field appears, **FAVAssignments** will not appear. It has only one allowed value, - (a dash).

7. **FAVAssignments**

This field groups the following **FAV_29d** fields. There can be from one to 437 **29d** fields in each **FAVAssignments** element.

8. **FAV_29d**

This field provides the FAV Airspace Assignment number. It is shown as four digits, with leading zeros as needed. Examples: **0053**, **2509**.

9. **tracon**

This field is used to group the following fields: **tracon_29g**, **traconNoFAV_29h**, **traconFAVAssignments**, and grouped under **traconFAVAssignments**, **traconFAV_29i**. Each **tracon** element can have one **tracon_29g**, followed by either a **traconNoFAV_29h** field or a **traconFAVAssignments** group. The **tracon** grouping can appear from one to one hundred times.

10. **tracon_29g**

This field is the TRACON identifier, for which the following FAV data applies. It is a three-letter field. For example: **PIP**.

11. **traconNoFAV_29h**

When this field appears, it indicates that there is no FAV assignment for this TRACON. If this field appears, **FAVAssignments** will not appear. It has only one allowed value, - (a dash).

12. **traconFAVAssignments**

This field groups the following **traconFAV_29i** fields. There can be from one to 437 29i fields in each **traconFAVAssignments** element.

13. **traconFAV_29i**

This field provides the FAV Airspace Assignment number. It is shown as four digits, with leading zeros as needed. Examples: **0053**, **2509**.

4.2.2 Route Status [HR]

The HR is the Route Status message. It provides the status of adapted arrival and departure routes (i.e., whether a given route is active or inactive).

A route status is indicated by the route name followed by either “ON” or “OFF.”. For example, the following indicates that the route named LZCR4 is active and the route LZLG8 is inactive.

Route (135a): LZCR4

Action indicator (36a): ON

Route (135a): LZLG8

Action indicator (36a): OFF

The fields in the message are as follows:

1. **sourceId_00e**

This field is required on all messages sent from ERAM. It contains a time followed by a sequence number. The time is in the format hhmmss, where hh stands for the two-digit hour (00-23), mm for the two-digit minute (00-59), and ss for the two-digit second (00-59). The four-digit sequence number falls in the range 0000-9999.

2. **sourceTime_00e1**

This field is a breakdown of the first section of **sourceId_00e**. It contains a time in the format hh_mm_ss, where hh stands for the two-digit hour (00-23), mm for the two-digit minute (00-59), and ss for the two-digit second (00-59).

3. **sourceSeqNo_00e2**

This field is the second part of **sourceId_00e**. It is a sequence number. The four-digit sequence number falls in the range 0000-9999.

4. **routeStatus**

This field groups the following two, **routeStatusElements_135a** and **actionIndicator_36a**. It can be repeated from one to 281 times.

5. **routeStatusElements_135a**

Contains the adapted route status elements. The adapted names are Standard Instrument Departures (SID), Standard Terminal Arrival Routes (STAR), Adapted Arrival Routes (AAR), Adapted Departure Routes (ADR) and Adapted Departure and Arrival Routes (ADAR) that are active when initialization begins. The format is two to six alphanumeric characters. For example: **SD001**.

6. **action_indicator_36a**

This field shows the status of the route elements in field 135a. It can have one of two possible values: **ON** or **OFF**.

4.2.3 Special Activities Airspace (SAA) [SU]

The SU is the Special Activities Airspace (SAA) message. It provides the status and schedules for the Special Activities Airspace.

The fields in the message are as follows:

1. **sourceId_00e**

This field is required on all messages sent from ERAM. It contains a time followed by a sequence number. The time is in the format hhmmss, where hh stands for the two-digit hour (00-23), mm for the two-digit minute (00-59), and ss for the two-digit second (00-59). The four-digit sequence number falls in the range 0000-9999.

2. **sourceTime_00e1**

This field is a breakdown of the first section of **sourceId_00e**. It contains a time in the format hh_mm_ss, where hh stands for the two-digit hour (00-23), mm for the two-digit minute (00-59), and ss for the two-digit second (00-59).

3. sourceSeqNo_00e2

This field is the second part of **sourceId_00e**. It is a sequence number. The four-digit sequence number falls in the range 0000-9999.

4. saaId_161a

This field is the ID for the special activities airspace. It consists of one to ten alphanumerics. For example: **SHPT38ALPHA** means SHP Air Force BASE training area “Alpha” for T38s.

5. saaActivationType_162a

This field provides the status of the SAA area. There are three possible values: **ON** (area is active), **OFF** (area is not active), **SCHED** (area activation is controlled by schedule).

6. saaScheduleId_166a

Contains the ID of the facility scheduling followed by a sequence number. The format is three letters followed by ten digits. For example: **SHP0000000016**.

7. saaScheduleType_163a

This field describes whether the activity for the airspace is Scheduled or Deleted. There are two allowed values: **S** or **D**.

8. saaSchedActivationTime_164a

Contains the dates and UTC times of an activation period in the format ddhhmm (dd: day of month, hh: UTC hour, mm: UTC minute).

9. saaSchedDeactivationTime_164b

Contains the dates and UTC times of a deactivation period in the format ddhhmm (dd: day of month, hh: UTC hour, mm: UTC minute).

10. saaLowAlt_165a

Contains the lower limit of the altitude range for the airspace. It is expressed in feet, and the valid range is from -2000 to 100000.

11. saaHighAlt_165b

Contains the upper limit of the altitude range for the airspace. It is expressed in feet, and the valid range is from -2000 to 100000. The high altitude must be greater than or equal to the low altitude. If the high altitude is equal to the low altitude, the SAA is active only at this altitude.

4.2.4 Altimeter Setting [HA]

The HA is the Altimeter Setting message. It is used to relay altimeter reference data for selected adapted reporting stations, generally airports. The altimeter data is used for altitude correction.

The altimeter reference data includes the data reporting time (35a), the reporting station (13.3), and the altimeter setting (34a).

ERAM generates an HA when an altimeter setting is processed. ERAM receives most altimeter settings from the Weather Message Switching Center Replacement (WMSCR), but occasionally a value might be entered by a controller. Either source causes ERAM to generate an HA message; there is no way to distinguish the source.

ERAM at an ARTCC may receive altimeter data for many stations, both internal and external to that ARTCC. As a result, FDPS may receive multiple copies of altimeter setting data for a particular station. For example, SFDPS could receive HA messages from ZBW, ZNY, ZDC, ZOB, ZTL, and ZLA for the airport DCA. In almost all cases, these messages will be copies of the same data; that is, they will have the same data reporting time and altimeter setting.

The fields in the message are as follows:

1. **sourceId_00e**

This field is required on all messages sent from ERAM. It contains a time followed by a sequence number. The time is in the format hhmmss, where hh stands for the two-digit hour (00-23), mm for the two-digit minute (00-59), and ss for the two-digit second (00-59). The four-digit sequence number falls in the range 0000-9999.

2. **sourceTime_00e1**

This field is a breakdown of the first section of **sourceId_00e**. It contains a time in the format hh_mm_ss, where hh stands for the two-digit hour (00-23), mm for the two-digit minute (00-59), and ss for the two-digit second (00-59).

3. **sourceSeqNo_00e2**

This field is the second part of **sourceId_00e**. It is a sequence number. The four-digit sequence number falls in the range 0000-9999.

4. **observedTime_35a**

This field represents the time of the observed altimeter setting. It is in XML dateTime format.

5. **stationId_13_3**

This field specifies an adapted altimeter reporting station. Its format is two to five alphanumerics. Example: **H5B**.

6. altimeterData_34a

This field reports the three digits of barometric pressure. An altimeter setting of 000-499 implies a value of 3000-3499, and a setting of 500-999 implies a value of 2500-2999. The only possible range of settings is 2500 to 3499. **NOTE:** The leading digit 2 or 3 is not reported. Its format is three digits.

7. altimeterReportMissing_34b

This field indicates that the altimeter data for the associated reporting station is missing. Its only allowed value is **M**. Either this field or 34a will appear in the HA message.

4.3 Operational Data Messages Details

4.3.1 Traffic Count Adjustment [AK]

The AK message is the Traffic Count Adjustment message. It may be used to adjust (increment or decrement) one of the following traffic counts:

- ACDD (Air Carrier Domestic Departures)
- ATDD (Air Taxi Domestic Departures)
- GADD (General Aviation Domestic Departures)
- MIDD (Military Domestic Departures)
- ACDO (Air Carrier Domestic Overs)
- ATDO (Air Taxi Domestic Overs)
- GADO (General Aviation Domestic Overs)
- MIDO (Military Domestic Overs)
- ACOD (Air Carrier Oceanic Departures)
- ATOD (Air Taxi Oceanic Departures)
- GAOD (General Aviation Oceanic Departures)
- MIOD (Military Oceanic Departures)
- ACOO (Air Carrier Oceanic Overs)
- ATOO (Air Taxi Oceanic Overs)
- GAOO (General Aviation Oceanic Overs)
- MIOO (Military Oceanic Overs)
- VFRC (VFR Traffic Count)

The fields in the message are as follows:

1. **sourceId_00e**

This field is required on all messages sent from ERAM. It contains a time followed by a sequence number. The time is in the format hhmmss, where hh stands for the two-digit hour (00-23), mm for the two-digit minute (00-59), and ss for the two-digit second (00-59). The four-digit sequence number falls in the range 0000-9999.

2. **sourceTime_00e1**

This field is a breakdown of the first section of **sourceId_00e**. It contains a time in the format hh_mm_ss, where hh stands for the two-digit hour (00-23), mm for the two-digit minute (00-59), and ss for the two-digit second (00-59).

3. **sourceSeqNo_00e2**

This field is the second part of **sourceId_00e**. It is a sequence number. The four-digit sequence number falls in the range 0000-9999.

4. **flightId_02a**

This field is the Aircraft ID, or flight ID, or Call Sign. It has a variable format, starting with one uppercase alphabetic character, followed by one to six alphanumeric characters. When it is only two characters long, the format is one letter followed by one digit, such as A1 for Air Force One.

5. **computerId_02d**

The computer ID is represented by three alphanumeric characters. The allowed patterns are ddd, ddL, dLd, and dLL. The letters **I** and **O** are prohibited. One special all-alphabetic code may be used, literally **XXX**. This special code is only used in DA (Data Accept) messages in response to an ARTS VFR flight plan input. This field is optional.

6. **sspId_167a**

This field is the Site Specific Plan Identifier. The format is a one- to four-digit string in the range from 0 – 4000. Its value is assigned by Instrument Flight Procedures Automation (IFPA). It is unique for a flight plan in each ERAM facility. This field is optional.

7. **trafficCountAdjustment_337a**

Contains the adjustment data. The first four characters of the data field must be alphabetic and one of the following subcategory contractions:

- ACDD Air Carrier Domestic Departures
- ATDD Air Taxi Domestic Departures
- GADD General Aviation Domestic Departures

- MIDD Military Domestic Departures
- ACDO Air Carrier Domestic Overs
- ATDO Air Taxi Domestic Overs
- GADO General Aviation Domestic Overs
- MIDO Military Domestic Overs
- ACOD Air Carrier Oceanic Departures
- ATOD Air Taxi Oceanic Departures
- GAOD General Aviation Oceanic Departures
- MIOD Military Oceanic Departures
- ACOO Air Carrier Oceanic Overs
- ATOO Air Taxi Oceanic Overs
- GAOO General Aviation Oceanic Overs
- MIOO Military Oceanic Overs
- VFRC VFR Traffic Count

The four letters are followed by either a plus sign (+) or minus sign (-) and three digits from 000 – 999.

8. **enteringFacilityId_332a**

Contains the facility identifier, a single letter identifying the entering facility. Each ERAM facility has a unique one letter identifier.

9. **positionType_331a**

This field is the position type, a single letter identifying the type of ATC position from which the data was entered. The position type must be either:

- **R** – R-position console
- **D** – D-position console
- **A** – A-position console
- **S** – AT Specialist

10. **sectorNumber_327a**

Contains a two-digit sector number. It is used when **positionType_331a** is **R**, **D**, or **A**. Otherwise, **enteringPosition_330a** is used.

11. enteringPosition_330a

Contains the position number identifying the entering position. It is used when positionType_331a is S. The position number must begin with a letter from A to Z, followed by a one digit identifier in the range 1 to 9. For example: **G2**.

4.3.2 Instrument Approach Count Adjustment [AC]

The AC message is the Instrument Approach Count Adjustment message. It may be used to adjust (increment or decrement) one of the following instrument approach counts:

- AC (air carrier)
- AT (air taxi)
- GA (general aviation)
- MI (military)

The fields in the message are as follows:

1. sourceId_00e

This field is required on all messages sent from ERAM. It contains a time followed by a sequence number. The time is in the format hhmmss, where hh stands for the two-digit hour (00-23), mm for the two-digit minute (00-59), and ss for the two-digit second (00-59). The four-digit sequence number falls in the range 0000-9999.

2. sourceTime_00e1

This field is a breakdown of the first section of **sourceId_00e**. It contains a time in the format hh_mm_ss, where hh stands for the two-digit hour (00-23), mm for the two-digit minute (00-59), and ss for the two-digit second (00-59).

3. sourceSeqNo_00e2

This field is the second part of **sourceId_00e**. It is a sequence number. The four-digit sequence number falls in the range 0000-9999.

4. flightId_02a

This field is the Aircraft ID, or flight ID, or Call Sign. It has a variable format, starting with one uppercase alphabetic character, followed by one to six alphanumeric characters. When it is only two characters long, the format is one letter followed by one digit, such as A1 for Air Force One.

5. computerId_02d

The computer ID is represented by three alphanumeric characters. The allowed patterns are ddd, ddL, dLd, and dLL. The letters **I** and **O** are prohibited. One special all-alphabetic code may be used, literally **XXX**. This special code is only used in DA (Data Accept) messages in response to an ARTS VFR flight plan input. This field is optional.

6. sspId_167a

This field is the Site Specific Plan Identifier. The format is a one- to four-digit string in the range from 0 – 4000. Its value is assigned by Instrument Flight Procedures Automation (IFPA). It is unique for a flight plan in each ERAM facility. This field is optional.

7. stationId_13_3

This field specifies a reporting airport. Its format is two to five alphanumerics. Example: AUS.

8. action_indicator_36h

This field shows the status of the instrument approach count. Either this field or the following field, instrumentApproachCountAdjustment_338a, can appear, but not both. It can have one of three possible values: AUTO, ON, or OFF.

9. instrumentApproachCountAdjustment_338a

Contains the adjustment data. The first two characters of the data field must be alphabetic and one of the following contractions:

- AC - air carrier
- AT - air taxi
- GA - general aviation
- MI – military

The two letters are followed by either a plus sign (+) or minus sign (-) and two digits from 00 – 99. There can be one to four occurrences of field 338a (if field 36h is not present).

10. enteringFacilityId_332a

Contains the facility identifier, a single letter identifying the entering facility. Each ERAM facility has a unique one letter identifier.

11. positionType_331a

This field is the position type, a single letter identifying the type of ATC position from which the data was entered. The position type must be either:

- **R** – R-position console
- **D** – D-position console
- **A** – A-position console
- **S** – AT Specialist

12. **sectorNumber_327a**

Contains a two-digit sector number. It is used when **positionType_331a** is **R**, **D**, or **A**. Otherwise, **enteringPosition_330a** is used.

13. **enteringPosition_330a**

Contains the position number identifying the entering position. It is used when **positionType_331a** is **S**. The position number must begin with a letter from A to Z, followed by a one digit identifier in the range 1 to 9. For example: **G2**.

4.3.3 Sign In Sign Out [SY]

The SY message is the Sign In/Sign Out message. It is sent from ERAM each time a sign in or sign out occurs, or when a reconstitution request is received.

The fields in the message are as follows:

1. **sourceId_00e**

This field is required on all messages sent from ERAM. It contains a time followed by a sequence number. The time is in the format hhmmss, where hh stands for the two-digit hour (00-23), mm for the two-digit minute (00-59), and ss for the two-digit second (00-59). The four-digit sequence number falls in the range 0000-9999.

2. **sourceTime_00e1**

This field is a breakdown of the first section of **sourceId_00e**. It contains a time in the format hh_mm_ss, where hh stands for the two-digit hour (00-23), mm for the two-digit minute (00-59), and ss for the two-digit second (00-59).

3. **sourceSeqNo_00e2**

This field is the second part of **sourceId_00e**. It is a sequence number. The four-digit sequence number falls in the range 0000-9999.

4. controllerInitials_317a

Contains the controller initials for a sign in/sign out action. The format is two letters followed by an optional alphanumeric character.

5. nonOperationalUserInitials_318a

Contains the nonoperational user initials for a sign in or sign out action. The format is two letters followed by an optional alphanumeric character.

6. crewNumber_319a

Contains the crew number associated with the user(s) at the time of a sign in or sign out action. It is a single digit from 0 through 9.

7. areaNumber_320a

Contains the area number in a sign in or sign out action. The area number is an adapted value correlating a defined area to a sector, i.e., the target position for a sign in/sign out action. It is a single digit from 0 through 9.

8. inOutIndicator_321a

Contains the type of message in a sign in or sign out action. The type can be either a sign in: **I** or sign out: **O**.

9. role_322a

Contains the task of the user in a sign in or sign out action, either an operational role: **O** or a training role: **T**.

10. tracker_323a

Contains the responsibilities of the user in a sign in or sign out action, either handoff controller (**Y**) or not handoff controller (**N**).

11. signInTime_324a

Contains the date and time for a sign in action. Sign in date and time is provided in 12 digits representing year, month, day, and time in hours and minutes, that is, `yyyymmddhhmm`. Current system time is always used for a sign in action except for those initiated at the AT Specialist Position, which may optionally include date and time as part of the sign in message. Example: **201301242147**.

When both field 324a and 325a are included in a sign in/sign out action, the user will be signed in and automatically signed out at the same position.

12. signOutTime_325a

Contains the date and time for a sign out action. Sign out date and time is provided in 12 digits representing year, month, day, and time in hours and minutes, that is, `yyyymmddhhmm`. Current system time is always used for a sign out action except for those initiated at the AT Specialist Position, which may optionally include date and time as part of the sign out message. Example: **201301242147**.

When both field 324a and 325a are included in a sign in/sign out action, the user will be signed in and automatically signed out at the same position.

13. localUTCOffset_329a

Contains the local UTC time offset, i.e. the number of hours, plus or minus, that local midnight occurs relative to UTC midnight. Its format is a plus (+) or minus (-) sign followed by two digits. For example: -06.

14. position_326a

Contains the target position, i.e., the position where a sign in/sign out action occurs. The position that a user is attempting to sign into is defined as the target position, and is determined by either the sector position that the command is entered from (R-, D-, or A-positions), or the sector position contained in a SISO message entered at the AT Specialist position. The format is one letter, and there are four allowed values:

- **R** – R-position console
- **D** – D-position console
- **A** – A-position console
- **N** – Pseudo position

15. sectorNumber_327a

Contains a two-digit sector number. When used in a sign in/sign out action designating an "N" position, the sector number is not checked to determine if it is adapted in the center.

16. recordingReason_328a

Contains the reason for recording a sign-in/sign-out action. The reason for the action must be one of the following:

- **0** - Sign In/Sign Out entered from a Sector Position
- **1** - Sign In/Sign Out (less than two time fields) entered from an AT Specialist Position
- **2** - Sign Out due to a resectorization

- **3** - Forced Sign Out due to another Sign In
- **4** - Automatically Signed Back In
- **5** - Sign In/Sign Out due to a Sign In with two time fields from an AT Specialist Position.

This field is optional.

4.3.4 Beacon Code Utilization [UB]

The UB message is the Beacon Code Utilization message. It is used to provide the peak number of beacon codes used, the total number of adapted codes, and the number of code reassignments since start-up or local midnight, for an adapted period of time. The peak number of beacon codes used and the total number of adapted codes will be broken down by the following categories:

- Internal primary and secondary codes
- Internal tertiary codes
- External primary and secondary codes
- External tertiary codes

The fields in the message are as follows:

1. **sourceId_00e**

This field is required on all messages sent from ERAM. It contains a time followed by a sequence number. The time is in the format hhmmss, where hh stands for the two-digit hour (00-23), mm for the two-digit minute (00-59), and ss for the two-digit second (00-59). The four-digit sequence number falls in the range 0000-9999.

2. **sourceTime_00e1**

This field is a breakdown of the first section of **sourceId_00e**. It contains a time in the format hh_mm_ss, where hh stands for the two-digit hour (00-23), mm for the two-digit minute (00-59), and ss for the two-digit second (00-59).

3. **sourceSeqNo_00e2**

This field is the second part of **sourceId_00e**. It is a sequence number. The four-digit sequence number falls in the range 0000-9999.

4. **internalPrimarySecondaryAdaptedCodes_47a**

Contains the peak number of internal primary and secondary codes and the total number of adapted codes. Its format is a four-digit number followed by a forward slash, followed by another four-digit number. Example: **0045/0315**.

5. **internalTertiaryAdaptedCodes_47b**

Contains the peak number of internal tertiary codes and the total number of adapted codes. Its format is a four digit number flowed by a forward slash, followed by another four digit number. Example: **0000/0000**.

6. **externalPrimarySecondaryAdaptedCodes_47c**

Contains the peak number of external primary and secondary codes and the total number of adapted codes. Its format is a four-digit number flowed by a forward slash, followed by another four-digit number. Example: **0067/0378**.

7. **externalTertiaryAdaptedCodes_47d**

Contains the peak number of external tertiary codes and the total number of adapted codes. Its format is a four-digit number flowed by a forward slash, followed by another four-digit number. Example: **0000/0000**.

8. **codeReassignments_47e**

Contains the number of code reassignments since midnight. It consists of four digits in the range of 0000 – 9999.

4.3.5 Geographical Beacon Code Utilization [UG]

The UG message is the Geographic Beacon Code Utilization message. It is used to provide the total number of adapted beacon codes for each destination region as well as the peak number of beacon codes used for each destination region during the period.

The fields in the message are as follows:

1. **sourceId_00e**

This field is required on all messages sent from ERAM. It contains a time followed by a sequence number. The time is in the format hhmmss, where hh stands for the two-digit hour (00-23), mm for the two-digit minute (00-59), and ss for the two-digit second (00-59). The four-digit sequence number falls in the range 0000-9999.

2. **sourceTime_00e1**

This field is a breakdown of the first section of **sourceId_00e**. It contains a time in the format hh_mm_ss, where hh stands for the two-digit hour (00-23), mm for the two-digit minute (00-59), and ss for the two-digit second (00-59).

3. **sourceSeqNo_00e2**

This field is the second part of **sourceId_00e**. It is a sequence number. The four-digit sequence number falls in the range 0000-9999.

4. **elapsedTime_50a**

This field shows elapsed time since the last report in minutes. It is four digits between 0000 and 1440.

5. **destinationRegionId_50b**

Contains the destination region identifier. Its format is two digits. This field and the following two can be repeated as a group from one to 50 times.

6. **geoPrimaryAdaptedCodes_50c**

Contains the peak number of geographic primary beacon codes and the total number of adapted primary codes for the region. Its format is a four-digit number followed by a forward slash, followed by another four-digit number. Example: **0045/0315**.

7. **geoSecondaryAdaptedCodes_50d**

Contains the peak number of geographic secondary beacon codes and the total number of adapted secondary codes for the region. Its format is a four-digit number followed by a forward slash, followed by another four-digit number. Example: **0045/0315**.

4.4 General Messages Details

4.4.1 General Information [GH]

The GH is the General Information message. It provides general information/free text remarks to ATM client applications. ERAM sends a GH message to a specific ATM client application or to all ATM client applications via ATM IPOP, as indicated by destination address routing.

The fields in the message are as follows:

1. **sourceId_00e**

This field is required on all messages sent from ERAM. It contains a time followed by a sequence number. The time is in the format hhmmss, where hh stands for the two-digit hour (00-23), mm for the two-digit minute (00-59), and ss for the two-digit second (00-59). The four-digit sequence number falls in the range 0000-9999.

2. **sourceTime_00e1**

This field is a breakdown of the first section of **sourceId_00e**. It contains a time in the format hh_mm_ss, where hh stands for the two-digit hour (00-23), mm for the two-digit minute (00-59), and ss for the two-digit second (00-59).

3. **sourceSeqNo_00e2**

This field is the second part of **sourceId_00e**. It is a sequence number. The four-digit sequence number falls in the range 0000-9999.

4. **remarks_11c**

This field is an unrestricted string, from one to 400 characters in length. It has an attribute called **remarktype** with the possible values of interfacility or intrafacility. A few examples:

|ECON DESCENT

|FRC

|TCAS UNITED LIVERY

This field is optional.

4.4.2 Interim Altitude Status: [HE]

ERAM sends an HE message whenever ERAM initializes and Interim Altitude information is still in effect. The HE message is only sent as part of the initialization sequence.

The fields in the message are as follows:

1. **sourceId_00e**

This field is required on all messages sent from ERAM. It contains a time followed by a sequence number. The time is in the format hhmmss, where hh stands for the two-digit hour (00-23), mm for the two-digit minute (00-59), and ss for the two-digit second (00-59). The four-digit sequence number falls in the range 0000-9999.

2. **sourceTime_00e1**

This field is a breakdown of the first section of **sourceId_00e**. It contains a time in the format hh_mm_ss, where hh stands for the two-digit hour (00-23), mm for the two-digit minute (00-59), and ss for the two-digit second (00-59).

3. **sourceSeqNo_00e2**

This field is the second part of **sourceId_00e**. It is a sequence number. The four-digit sequence number falls in the range 0000-9999.

4. **flightId_02a**

This field is the Aircraft ID, or flight ID, or Call Sign. It has a variable format, starting with one uppercase alphabetic character, followed by one to six alphanumeric characters. When it is only two characters long, the format is one letter followed by one digit, such as A1 for Air Force One.

5. **computerId_02d**

The computer ID is represented by three alphanumeric characters. The allowed patterns are ddd, ddL, dLd, and dLL. The letters **I** and **O** are prohibited. One special all-alphabetic code may be used, literally **XXX**. This special code is only used in DA (Data Accept) messages in response to an ARTS VFR flight plan input. This field is optional.

6. **sspId_167a**

This field is the Site Specific Plan Identifier. The format is a one- to four-digit string in the range from 0 – 4000. Its value is assigned by Instrument Flight Procedures Automation (IFPA). It is unique for a flight plan in each ERAM facility. This field is optional.

7. **interimAlt_76b**

This field is the interim altitude for the flight. Its format is one to three digits, from 0 – 999.

4.4.3 Hold Status Information[HO]

The HO message provides hold information (holding fix, and estimated fix departure time for definite-duration holds) on all active aircraft during the initialization process. ERAM sends a HO message whenever ERAM initializes and Hold information is still in effect. The Hold Status Information message is only sent as part of the initialization sequence.

The fields in the message are as follows:

1. **sourceId_00e**

This field is required on all messages sent from ERAM. It contains a time followed by a sequence number. The time is in the format hhmmss, where hh stands for the two-digit hour (00-23), mm for the two-digit minute (00-59), and ss for the two-digit second (00-59). The four-digit sequence number falls in the range 0000-9999.

2. **sourceTime_00e1**

This field is a breakdown of the first section of **sourceId_00e**. It contains a time in the format hh_mm_ss, where hh stands for the two-digit hour (00-23), mm for the two-digit minute (00-59), and ss for the two-digit second (00-59).

3. **sourceSeqNo_00e2**

This field is the second part of **sourceId_00e**. It is a sequence number. The four-digit sequence number falls in the range 0000-9999.

4. **flightId_02a**

This field is the Aircraft ID, or flight ID, or Call Sign. It has a variable format, starting with one uppercase alphabetic character, followed by one to six alphanumeric characters. When it is only two characters long, the format is one letter followed by one digit, such as A1 for Air Force One.

5. **computerId_02d**

The computer ID is represented by three alphanumeric characters. The allowed patterns are ddd, ddL, dLd, and dLL. The letters **I** and **O** are prohibited. One special all-alphabetic code may be used, literally **XXX**. This special code is only used in DA (Data Accept) messages in response to an ARTS VFR flight plan input. This field is optional.

6. **sspId_167a**

This field is the Site Specific Plan Identifier. The format is a one- to four-digit string in the range from 0 – 4000. Its value is assigned by Instrument Flight Procedures Automation (IFPA). It is unique for a flight plan in each ERAM facility. This field is optional.

7. **interimAlt_76b**

This field is the interim altitude for the flight. Its format is one to three digits, from 0 – 999.

8. **holdDataFix_21a**

This field shows the fix where the flight is holding along the filed route of flight. Any of the valid fix specifiers can be used, as shown in field **coordFix_06a** (See coordFix_06a on page 20).

9. **holdDataTime_21d**

This field is used to specify the time when the flight can expect further clearance at the holding location. It is in hhmm format. This field is optional.

4.4.4 Unsuccessful Information Transmission [UI]

The UI message is sent when the transmission of flight data is unsuccessful due to a transmission error or because transmission of the flight data is inhibited. The remote facility may be an adjacent NAS, ATOP, ARTS, Non-US Manual ARTCC or adjacent Non-U.S. Automated Facility.

If there is no coordination sector for an active flight plan or no departure sector for a proposed flight plan, ERAM will not transmit a UI message.

ERAM will transmit the UI message as part of system initialization of an ATM IPOP.

The fields in the message are as follows:

1. sourceId_00e

This field is required on all messages sent from ERAM. It contains a time followed by a sequence number. The time is in the format hhmmss, where hh stands for the two-digit hour (00-23), mm for the two-digit minute (00-59), and ss for the two-digit second (00-59). The four-digit sequence number falls in the range 0000-9999.

2. sourceTime_00e1

This field is a breakdown of the first section of **sourceId_00e**. It contains a time in the format hh_mm_ss, where hh stands for the two-digit hour (00-23), mm for the two-digit minute (00-59), and ss for the two-digit second (00-59).

3. sourceSeqNo_00e2

This field is the second part of **sourceId_00e**. It is a sequence number. The four-digit sequence number falls in the range 0000-9999.

4. flightId_02a

This field is the Aircraft ID, or flight ID, or Call Sign. It has a variable format, starting with one uppercase alphabetic character, followed by one to six alphanumeric characters. When it is only two characters long, the format is one letter followed by one digit, such as A1 for Air Force One.

5. computerId_02d

The computer ID is represented by three alphanumeric characters. The allowed patterns are ddd, ddL, dLd, and dLL. The letters **I** and **O** are prohibited. One special all-alphabetic code may be used, literally **XXX**. This special code is only used in DA (Data Accept) messages in response to an ARTS VFR flight plan input. This field is optional.

6. sspId_167a

This field is the Site Specific Plan Identifier. The format is a one- to four-digit string in the range from 0 – 4000. Its value is assigned by Instrument Flight Procedures Automation (IFPA). It is unique for a flight plan in each ERAM facility. This field is optional.

7. FAV_29d

This field provides the FAV Airspace Assignment number. It is shown as four digits, with leading zeros as needed. Examples: **0053**, **2509**.

4.4.5 ERAM Status Information [HS]

The HS message is sent by ERAM to an ATM IPOP to indicate a change in ERAM status to include:

- TMAD On/Off
- Operational on channel in Active Mode
- Operational on channel in Test Mode
- Channel Switch
- PAS/SAS Switch

The HS message is sent as part of system initialization

The fields in the message are as follows:

1. sourceId_00e

This field is required on all messages sent from ERAM. It contains a time followed by a sequence number. The time is in the format hhmmss, where hh stands for the two-digit hour (00-23), mm for the two-digit minute (00-59), and ss for the two-digit second (00-59). The four-digit sequence number falls in the range 0000-9999.

2. sourceTime_00e1

This field is a breakdown of the first section of **sourceId_00e**. It contains a time in the format hh_mm_ss, where hh stands for the two-digit hour (00-23), mm for the two-digit minute (00-59), and ss for the two-digit second (00-59).

3. sourceSeqNo_00e2

This field is the second part of **sourceId_00e**. It is a sequence number. The four-digit sequence number falls in the range 0000-9999.

4. statusChangeIndicator 140a

Three characters LLL where LLL =

INA = inactive

ON2 = operational using live inputs

5. **statusIndicator_140b**

Three characters LLL where LLL =

PSN = planned shutdown not active

6. **statusChangeIndicator_140c**

Three characters LLL where LLL =

SSW = channel switch

SSO = PAS/SAS switch

SSN= channel switch or PAS/SAS switch not in effect

7. **statusChangeIndicator_140d**

Three characters LLL where LLL =

DOF = TMAD off

DON = TMAD on

8. **statusIndicator_140e**

Two characters LL where LL =

ON = RVSM is on

9. **systemTypeIdentification_168a**

Four characters LLLL where LLLL = ERAM

10. **cmsVersionNumber_169a**

This field is the CMS version number that will be preset data maintained by IFPA. This number will be incremented by 1 manually when changes are made to formats or contents of messages exchanged between ERAM and ATM IPOP in the HS message. It is a four-digit string. Example: **0031**.

4.5 Reconstitution Messages Details

This chapter provides details for Database Record Transfer (DBRT) reconstitution messages received from HADDs.

Note: Message descriptions were excerpted from: *Interface Control Document, NAS-IC-40010001 Revision E, For Interface between Host Interface Device (HID)/National Airspace System (NAS) Local Areal Network (LAN)(HNL), Applications, Host Air Traffic Management (ATM) Data Distribution System*

4.5.1 DBRTSI – DBRT Sector Assignment Information

Contains Fixed Posting Area (FPS) to sector assignment for a single sector. The transmitted data comes from the latest valid sector assignment status information message (SH) received by HADDs at the time of client connection.

1. sector_29a

This field is the sector identifier, for which the following FAV data applies. It is a two-digit field. For example: **29**. Required.

2. noFAV_29c

When this field appears, it indicates that there is no FAV assignment for this sector. If this field appears, FAVAssignments will not appear. It has only one allowed value, - (a dash). Optional.

3. FAVAssignments

This field groups the following FAV_29d fields. There can be from one to 437 29d fields in each FAVAssignments element. Optional.

4. FAV_29d

This field provides the FAV Airspace Assignment number. It is shown as four digits, with leading zeros as needed. Examples: **0053**, **2509**. Optional.

5. seqNoOfLastSectorAssignmentStatusMsg_250c

This element specifies the sequence number of the last sector assignment status message received.. Required.

6. timeLastSectorAssignmentStatusMsgRcvd_250d

This element specifies the time of the last sector assignment status message received. Required.

4.5.2 DBRTAI – DBRT Altimeter Status Information

Contains the current altimeter setting. The data comes from CMS altimeter setting information messages (HA) sent to HADDs by the ERAM, and includes altimeter reporting station, the altimeter reading, and the time received.

1. observedTime_35a

This field represents the time of the observed altimeter setting. It is in XML dateTime format. Optional.

2. stationId_13_3

This field specifies an adapted altimeter reporting station. Its format is two to five alphanumerics. Example: **H5B**. Required.

3. altimeterData_34a

This field reports the three digits of barometric pressure. An altimeter setting of 000-499 implies a value of 3000-3499, and a setting of 500-999 implies a value of 2500-2999. The only possible range of settings is 2500 to 3499. **NOTE:** The leading digit 2 or 3 is not reported. Its format is three digits. Optional.

4. altimeterReportMissing_34b

This field indicates that the altimeter data for the associated reporting station is missing. Its only allowed value is **M**. Either this field or 34a will appear in the HA message. Optional.

5. seqNoOfLastAltimeterMsg_246d

This element specifies the sequence number of the last altimeter message received. Required.

6. timeLastAltimeterMsgRcvd_246e

This element specifies the time of the last altimeter message received. Required.

4.5.3 DBRTRI – DBRT Route Status Information

Contains the status of adapted departure and arrival routes. This message includes the information received from the CMS route status information message (HR) sent to HADDs by the ERAM.

1. routeStatusElements_135a

Contains the adapted route status elements. The adapted names are Standard Instrument Departures (SID), Standard Terminal Arrival Routes (STAR), Adapted Arrival Routes (AAR), Adapted Departure Routes (ADR) and Adapted Departure and Arrival Routes (ADAR) that are active when initialization begins. The format is two to six alphanumeric characters. For example: **SD001**. Required.

2. **action_indicator_36a**

This field shows the status of the route elements in field 135a. It can have one of two possible values: **ON** or **OFF**. Required.

3. **seqNoOfLastRouteStatusMsg_251c**

This element specifies the sequence number of the last route message was received. Required.

4. **timeLastRouteStatusMsgRcvd_251d**

This element specifies the time the last route message was received. Required.

4.5.4 DBRTFPI – DBRT Flight Plan Status Information

The transmitted data comes from the latest flight plan and track information received by HADDs at the time of client connection.

1. **computerId_02d**

The computer ID is represented by three alphanumeric characters. The allowed patterns are ddd, ddL, dLd, and dLL. The letters **I** and **O** are prohibited. One special all-alphabetic code may be used, literally **XXX**. This special code is only used in DA (Data Accept) messages in response to an ARTS VFR flight plan input. This field is optional.

2. **flightId_02a**

This field is the Aircraft ID, or flight ID, or Call Sign. It has a variable format, starting with one uppercase alphabetic character, followed by one to six alphanumeric characters. When it is only two characters long, the format is one letter followed by one digit, such as A1 for Air Force One.

3. **eramGufi_316a**

This field is a unique ID for each flight plan in the system.

The format consists of:

- ICAO country code, one letter
- en route facility ID, one letter
- time in seconds of current day, five digits (00000 – 86400)
- day of week, one digit (1-7)
- sequence number, two digits

The following fields are related to internal processing for the field **eramGufi_316a**:

- **eramGufi_316a0, eramGufi_316aNum, eramGufi_316aFPId**
Format: ICAO country code, one letter, en route facility ID, one letter; followed by time in seconds of current day, five digits (00000 – 86400), day of week, one digit (1-7), sequence number, two digits.

- **eramGufi_316aDT**

Format: yyyy-mm-dd T hh:mm:ss Z, followed by one or more digit

This field is optional.

4. **eramGufi_316aNum**

Contains the SFDPS server and numeric date representation of the eramGufi flight plan used internally by SFDPS. A sample looks like this: **1305208101**. Optional, required for flight messages.

5. **eramGufi_316aDT**

Contains the date and time representation of the eramGufi flight plan. A sample of this looks like this: **2014-03-10T09:12:27Z/000/08/500**. Optional, required for flight messages.

6. **sspId_167a**

This field is the Site Specific Plan Identifier. The format is a one- to four-digit string in the range from 0 – 4000. Its value is assigned by Instrument Flight Procedures Automation (IFPA). It is unique for a flight plan in each ERAM facility. This field is optional.

7. **numberOfAircraft_03a**

This field indicates the number of aircraft for the flight. Its format is one to two digits followed optionally by one uppercase letter to represent the Special Aircraft Indicator. The indicator can also appear on its own, without digits. If no such designator has been assigned, or in case of formation flights comprising more than one type, **ZZZZ** is entered and the (numbers and) type(s) of aircraft are entered in the **TYPIndicator_918h** field. An example of the number of aircraft is a formation of military aircraft flying under one flight plan. An example Special Aircraft Indicator is **H** for Heavy Jet. This field is optional.

8. **typeOfAircraft_03c**

The Type of Aircraft field is one letter followed by one to four alphanumeric characters. Some examples: **B52**, **B747**.

9. **airborneEquip_03e**

This field is the Airborne Equipment Qualifier. It consists of one alphabetic or numeric character. Some sample values are:

- **A** – Transponder with no Mode C
- **B** – Transponder with Mode C
- **E** - Flight Management System (FMS) with DME/DME and IRU position updating
- **X** – No transponder
- **W** – RVSM

This field is optional.

10. beaconCode_04a

The beacon code is represented by four octal digits (i.e., 0-7). When the last two digits of the four digits are zero, the beacon code is a nondiscrete code, a code that is not unique. A discrete, or unique, beacon code is any code not ending in 00. This field is optional. In addition, even if this field were populated in the source message from ERAM, if the enclosing message pertains to a non-active flight, this element will not be present in the version of the message that is sent to non-authorized users by SFDPS.

11. trueAirSpeed_05a

This field is represented in two to four digits, expressing true airspeed in the range 01 – 3700 knots.

12. machSpeed_05c

The mach speed is expressed as three digits with no decimal point, preceded by the letter **M**, up to M500. For example, the speed 0.85 Mach is represented by ‘M085’.

13. classifiedSpeed_05d

This field has a fixed value of **SC**. The adapted classified speed is not displayed on flight strips. The character string ‘SC’ is printed instead.

14. coordFix_06a

The coordination fix is the starting point from which to begin processing the flight plan route. It is from one of the following points:

- the departure airport,
- the airfile fix, or
- the adjacent center inbound coordination fix

For ARTS III flight plans, the coordination fix Field 06 is used as the inbound coordination fix or the outbound coordination fix or, for an ARTS internal flight, it can be the departure or destination airport. Because this field can represent a number of different things, there are multiple legal formats for it. It can be:

- A fix name consisting of two to five alphanumeric characters;
- A fix name with a radial and distance; fix name as above, followed by six digits;
- A lat/long: Four digits followed by an optional alpha character, followed by an forward slash(‘/’), followed by four to five digits, followed by an optional alpha character;
- A location identifier (LOCID): Three to four alphanumerics characters.

15. coordStatusTime_07d

This field is the starting time at the coordination fix (field 06a). The format is a single letter (one of **A, D, E, P, or F**) followed by four digits. The digits represent time as hhmm. The five alpha values represent:

- **A** – Active arrival flight plan for ARTS III only, aircraft is in the air
- **D** – Flight has departed from the departure airport
- **E** – Active flight plan, aircraft is in the air. For ARTS III ‘E’ indicates an overflight
- **F** – Flush flight plan. The adjacent Host Center is performing a shutdown. The adjacent center activates a pending Proposed flight plans with an ‘F’ Flush time and sends the flight plans to the adjacent ERAM. Flush times are only used Host to ERAM. The receiving ERAM processes the ‘F’ Flush time as a ‘P’ Proposed time.
- **P** – Proposed flight plan preparing for departure

16. coordStatus_07d1

The coordStatus field is the single letter, A, D, E, F, or P, as described above.

17. coordTime_07d2

The coordTime is the XML dateTime representing the starting time at the coordination fix.

18. delayTime_07e

This three-character field provides a delay time in minutes to be applied to the value in the 07d field.

19. departureTime_243n

This element specifies the reported (actual) departure time.

20. proposedDepartureTime_2431

This element specifies the proposed departure time.

21. estDepartureClearanceTime_2432

This element specifies the EDCT.

22. arrivalTime_28b

This element specifies the reported (actual) arrival time.

23. assignedAlt_08a

This field represents an assigned altitude or flight level in hundreds of feet, in two to three digits. Three digits are required for ARTS III. For example, an assigned altitude of 340 means that the aircraft is to fly at 34,000 feet.

Only one of the five altitude fields, 08a through 08e, will appear in a message.

24. assignedAlt_08b

This field has a fixed value of **OTP**, which means the aircraft is flying VFR-On-Top, it is flying above the clouds in VFR conditions.

25. assignedAlt_08c

This field's format is **OTP/**, followed by two to three digits indicating altitude. It represents an IFR flight operating above the clouds in VFR conditions. The sample value **OTP/250** means the aircraft is flying VFR-On-Top at 25,000 feet.

26. assignedAlt_08d

This field is an assigned block of altitudes for the flight to fly. It consists of two to three digits followed by the letter **B**, followed by two to three digits. The digits represent altitude or flight level in hundreds of feet. The lowest altitude is listed first. An example: **80B140**, meaning the flight is assigned an altitude block of 8,000 feet to 14,000 feet.

27. assignedAlt_08e

This field is used for an IFR flight operating above a specified altitude. Its format is **ABV/** followed by two to three digits. An example: **ABV/600**, meaning the flight is flying above 60,000 feet.

28. assignedAlt_08f

This is the assigned altitude a flight will fly at, before, and after a fix. The format is a two to three digit altitude in hundreds of feet followed by a forward slash, a fix specifier (see "coordFix_06a" on page 20 for formats), followed by another forward slash, and, finally, two or three digits. For example, **240/DAL350010/220** means to fly at 24,000 feet until reaching the fix radial distance represented by DAL350010, and then descend to 22,000 feet. The fix cannot be the arrival or departure point.

29. assignedAlt_08g

This field can have only one value, '**VFR**', for Visual Flight Rules.

30. assignedAlt_08h

This field represents a VFR flight with an altitude. Its format is '**VFR/**' followed by two or three digits showing altitude in hundreds of feet. An example is **VFR/75** meaning the aircraft is flying VFR at 7,500 feet.

31. requestedAlt_09a

This field is the requested altitude or flight level in hundreds of feet, in two to three digits. Three digits are required for ARTS III. For example, an assigned altitude of **340** means that the aircraft is requesting to fly at 34,000 feet.

At most, only one of the Requested Altitude fields (09a – 09g) will be included in a proposed flight message.

32. requestedAlt_09b

This field has a fixed value of **OTP**, which means the aircraft is requesting to fly VFR-On-Top.

33. requestedAlt_09c

This field's format is **OTP/**, followed by two to three digits. It represents an IFR flight requesting to operate above the clouds in VFR conditions. The sample value **OTP/250** means the aircraft is requesting VFR-On-Top at 25,000 feet.

34. requestedAlt_09d

This field is used for an IFR flight requesting to operate above a specified altitude. Its format is **ABV/** followed by two to three digits. An example: **ABV/600**, meaning the flight is requesting to fly above 60,000 feet.

35. requestedAlt_09e

This field is an assigned block of altitudes the flight has requested. It consists of two to three digits followed by the letter 'B', followed by two to three digits. The digits represent altitude or flight level in hundreds of feet. The lowest altitude must be listed first. An example: **80B140**.

36. requestedAlt_09f

This field can have only one value, 'VFR', for Visual Flight Rules.

37. requestedAlt_09g

This field represents a VFR flight with an altitude. Its format is 'VFR/' followed by two or three digits showing altitude in hundreds of feet.

38. flightPlanRoute_10a

The purpose of this field is to show how the flight will fly from the departure airport to the arrival airport. The route field 10 filed by the pilot can be very complex, considering that some flights fly half way around the world. Therefore, the route field contains several elements and sub-elements to describe the pilot's intentions as the flight progresses from the departure airport to the arrival airport. It is specified as a string field, which is made up of a chain of fixes and routes in the

FIX.ROUTE.FIX format. Elements in the sequence can be implied, such as FIX..FIX, or ROUTE..ROUTE. A complete description of all the possible subfield formats is beyond the scope of this document. Here is an example: **OKC.V14S.TUL.TUL090..FYV270.FYV**.

39. departurePoint_26a

The departure point is the point at which to start processing a flight plan. Any of the allowed ways to represent a fix can be used in this field, including the standard airport designators. A fix name, lat/long, or fix-radial-distance can also be used. Some examples are: **AB, DFW, KDFW, SHP090015, 3500N/04000W**.

40. destination_27a

The destination is the point at which to end processing a flight plan. Any of the allowed ways to represent a fix can be used in this field, including the standard airport designators. A fix name, lat/long, or fix-radial-distance can also be used. Some examples are: **AB, DFW, KDFW, SHP090015, 3500N/04000W**.

41. ETE_24

This element specifies the estimated time en route (ETE).

42. ETA_28a

This element specifies the estimated time of arrival at the flight plan destination.

43. remarks_11c

Flight plan remarks text.

44. holdDataFix_21a

This element specifies the position location for the flight to hold along the filed route of flight. If the message does not include the optional *holdDataTime_21d* element, the flight goes into an indefinite hold status when the flight arrives at the hold fix.

45. holdDataTime_21d

This element specifies the time the flight can expect further clearance at the holding location specified in the element *holdDataFix_21a*. This element can only be included in the HH messages if the element *holdDataFix_21a* is also included.

46. progressReportFix_18a

This element specifies the position location report of the flight along the filed route of flight.

47. progressReportTime_18d

This element specifies the time of the flight arriving at the fix specified in element progressReportFix_18a, above.

48. departureAutoRouteInhibitIndicator_244g

This element specifies whether the departure route from the departure airport is inhibited or not.

49. destinationAutoRouteInhibitIndicator_244h

This element specifies whether the arrival route to the arrival airport is inhibited or not.

50. interimAlt_76b

This element specifies the interim altitude for the flight in hundreds of feet.

51. AARFId10_142e

Field 142e consists of alphanumerics plus periods and forward slashes, with a length from four to 97 characters. An example: **./BLEUZ.RYTHM3**. This field is optional.

52. AARNonFId10_142f

Field 142f can be from four to 97 characters, as describe above for field ADARFId10_142a. An example: **J25.CRP+LISSE6+**. This field is optional.

53. ADRFId10_142c

Field 142c can be from four to 84 characters, as describe above for field ADARFId10_142a. An example: **./WOTRO.MAIER4..** This field is optional.

54. ADRNonFId10_142d

This non-field 10 format field can be from four to 84 characters: alphanumerics, periods, forward slashes and spaces. The non-Field 10 portions are delimited by plus signs. An example: **+RV SACO58065+FMG.J32**. This field is optional.

55. ADARFId10_142a

This and the five following fields represent the Preferential Route Alphanumerics, which are used to control the flow and separation of traffic departing and arriving at designated airports. This field is a subsection of the field flightPlanRoute_10a. It consists of alphanumerics plus periods (‘.’) and forward slashes, with a length of four to 44 characters. A sample: **.PSX2.PSX.V20.CRP**. This field is optional.

56. ADARNonFId10_142b

This non-field 10 format field can be from four to 44 characters-- alphanumerics and spaces-- and is delimited by plus signs (‘+’). An example: **+TS1 MEM270 LIT050+**. This field is optional

57. AARId_141c

If required for the flight, this field will contain the AAR adapted arrival route name. The format is five alphanumeric characters. This field is optional.**zdfz**

58. ADRIId_141b

If required for the flight, this field will contain the ADR adapted departure route name. The format is five alphanumeric characters. This field is optional.

59. ADARId_141a

If required for the flight, this field will contain the ADAR adapted departure arrival route name. The format is five alphanumeric characters. This field is optional.

60. FPA_143a0

FPA containing the first postable fix (1st).

61. FPA_143a1

FPA containing the first postable fix (2nd).

62. FPA_143a2

FPA containing the first postable fix (3rd).

63. FPA_143a3

FPA containing the first postable fix (4th).

64. FPA_143b0

The element specifies the FAV number containing the first fix where the route alteration occurs due to an AAR application.

65. FPA_143b1

The element specifies the FAV number containing the second fix where the route alteration occurs due to an AAR application.

66. FPA_143b2

The element specifies the FAV number containing the third fix where the route alteration occurs due to an AAR application.

67. FPA_143b3

The element specifies the FAV number containing the third fix where the route alteration occurs due to an AAR application.

68. timeBtw1stAndLastConvertedRouteFix_2449

The element specifies the time interval between the first and last converted route fix.

69. flightRules_908a

This field represents the flight rules with a single character.

- **I** – IFR
- **V** – VFR
- **Y** – IFR First
- **Z** – VFR First

If **Y** or **Z** is used, the point or points at which a change of flight rules is planned should be shown in the route. This field is optional.

70. typeOfFlight_908b

This field represents the type of flight, in one single character. The possible values are:

- **S** – Scheduled air transport
- **N** - Non-scheduled air transport
- **G** – General aviation
- **M** - Military
- **X** – Other flights

This field is optional.

71. wakeTurbulenceCat_909c

The wake turbulence category is one character. The possible values are:

- **H** – Heavy
- **M** – Medium
- **L** – Light

This field is optional.

72. comNavApproachEquip_910a

This field consists of one to 25 letters. If the letter **N** appears, it must be alone. Any of the other letters (**A-M**, **O-P**) can occur together, but each letter may only appear once. Each letter represents the presence of radio communication, navigation, or approach aid equipment on the flight. An example: **SCHJ**. This field is optional.

73. survEquip_910b

This field represents surveillance equipment on the flight. It can be one or two letters long: if two, the second letter must be D, which indicates that the equipment has ADS capability. The possible values are:

- N - Nil
- A – Transponder Mode A
- C – Transponder Mode A and C
- X – Transponder mode S without both aircraft ID and pressure-altitude transmission
- P – Transponder Mode S, with pressure-altitude transmission but no aircraft ID transmission
- I – Transponder Mode S with aircraft ID transmission but no pressure-altitude transmission
- S – Transponder Mode S with both pressure-altitude and aircraft ID transmission
- D – ADS Capability

This field is optional.

74. altAero_916c

Contains the alternate arrival points or aerodromes, if any. More than one alternate may be shown, with spaces separating them. They can be in the four-letter ICAO form for an aerodrome, or any of the fix formats described above. If two or more alternatives are shown, they can be in any combination of valid formats. This field is optional.

75. FDB4thLineHeading_155a

This field displays the heading of the aircraft issued by the controller. Its format is one to four alphanumeric characters. Samples: 075, H075.

76. FDB4thLineSpeed_155b

This field is used to display the speed of the aircraft issued by the controller. Valid formats are:

In Knots:

- ddd
- ddd+
- ddd–
- +d(d)
- –d(d)
- Sddd

In MACH:

- dd
- dd+
- .dd-
- M(d)dd
- Mdd+
- Mdd-
- .dd
- M.dd
- .dd+
- dd-

Other:

- PS
- +-

Some examples: **280+**, **S260**, **M83+**, **.75-**.

77. FDB4thLineText_155c

This field is used to display free-form text issued by the controller. It can be one to eight characters long. The allowed characters are the alphanumerics, -, +, =, *, /, underscore (_), semicolon (;), period (.), and comma (,). No leading or embedded spaces are allowed. Some examples: **BLVNS**, **-BUFFI**.

78. externalBeaconCode_04b

The external beacon code is in the same format as the beaconCode_04a field. Field 04b will contain the requested beacon code when the flight plan is inbound from an adjacent Center (or an adjacent Non-U.S. Automated Facility), when the requested beacon code is different from the assigned beacon code, and when the aircraft is not established on the assigned beacon code. Then, if the facility is adapted to receive Field 04b, Field 04b will be transmitted. This field is optional. In addition, even if this field were populated in the source message from ERAM, if the enclosing message pertains to a non-active flight, this element will not be present in the version of the message that is sent to non-authorized users by SFDPS.

79. localIntendedRoute_10b

The Local Intended Route field is the flight plan route that is coordinated to penetrated facilities. It consists of the flight plan route with any expected-to-be-applied-by-the-controlling-center ADRs, ADARs or AARs already applied. It is intended for the clients that wish to know the expected state of the flight plan when the current facility releases control of the flight. Local Intended Route Field 10b contains the filed route (field 10a) merged with any locally applicable adapted routes (preferential

routes, transition fixes and A-line fixes). Optional Field 10b will be sent to ATM-IPOP, when Field 10a is not the same as Field 10b. This field is optional.

80. timeRouteValues_2461

This element contains the time of the route values. Optional.

81. fixTimes

This element specifies the fix and calculated time of arrival at each fix that describes the aircraft's ERAM converted route of flight. Optional.

82. fixTime_68c

This element contains a fix and the expected time of arrival at the fix in hours and minutes. Optional.

83. fixTime_68c1

This element specifies the fix component of the element *fixTime_68c*. Optional.

84. crossingTime_68c2

This element specifies the time component of the element *fixTime_68c*. Optional.

85. adjacentCenterRouting

It groups the elements *outputRouting_253a* and *FAV_29d*. Optional.

86. outputRouting_253a

This element indicates the destination of the output message. Required in the element *adjacentCenterRouting*.

87. FAV_29d

This element provides the FAV Airspace Assignment number. Optional.

88. ICAOStoredFormat_918a

This is a one-character field. Its only possible value is 0 (zero), which means that none of the following indicator fields (918b – 918x) will be present. This field is optional.

89. EETIndicator_918b

EET stands for Estimated Elapsed Time. This field gives the accumulated estimated elapsed times to significant points or FIR boundaries, as prescribed on the basis of regional air navigation agreements, or by the appropriate ATS authority.

The format of the EET Indicator field is freeform text, up to a total of 3,000 characters. A sample: MMID0114 SEGU0417 SPIM0455. This field is optional.

90. RIFIndicator_918c

RIF stands for Revised in Flight. Contains the details of the route to the revised destination aerodrome, followed by the ICAO four-letter location indicator of the aerodrome. The revised route is subject to re-clearance in flight. An example: DTA HEC KLAX. This field is optional.

91. REGIndicator_918d

REG stands for Registration. It shows the registration markings (tail number) of the aircraft, if different from the aircraft identification in flightId_02a (section 3.2.1.4.). This field is optional.

92. SELIndicator_918e

SEL is short for SELCAL code. The SELCAL is a selective-calling radio system that alerts aircraft crew to incoming radio communications. This field is optional.

93. OPRIndicator_918f

This field is the name of the aircraft operator, if not obvious from the aircraft identification in flightId_02a (section 3.2.1.4). This field is optional.

94. STSIndicator_918g

This field shows the reason for special handling by ATS, e.g., hospital aircraft. These are the only valid special handling indicators:

- ALTRV
- ATFMX
- FFR
- FLTCK
- HAZMAT
- HEAD
- HOSP
- HUM
- MARSA
- MEDEVAC
- NONRVSM
- SAR
- STATE

- NONRNP10
- NO NRPN10
- PROTECTED
- CARGO
- CARGO FLT

This field is optional.

95. TYPIndicator_918h

This field shows the type(s) of aircraft, preceded if necessary by number(s) of aircraft, if ZZZZ is inserted in numberOfAircraft_03a (section 3.2.1.8). This field is optional.

96. PERIndicator_918i

The PER field shows aircraft performance data. Example: MACH 2. This field is optional.

97. COMIndicator_918j

Contains significant data related to communication equipment on board, as required by the appropriate ATS authority. An example: UHF only. This field is optional.

98. DATIndicator_918k

DAT shows significant data related to data link capability. The possible values and their meanings are:

- **S** - satellite data link
- **H** - HF data link
- **V** – VHF data link
- **M** – SSR Mode S data link

The field can show one or more of the allowed letters. For example: SV. This field is optional.

99. NAVIndicator_918l

This field shows the significant data related to navigation equipment as required by the appropriate ATS authority. For example: INS. This field is optional.

100. DEPIIndicator_918m

This field shows the name of the departure aerodrome. If ZZZZ is inserted in Field 13, or the ICAO four-letter location indicator of the location of the ATS unit from which supplementary flight plan

data can be obtained, if AFIL is inserted in Field 13. Note: Field 13 does not appear in AH, FH, and HU messages. An example: NORTON FIELD. This field is optional.

101.DESTIndicator_918n

This field is the name of the destination aerodrome, if ZZZZ is inserted in field 16. Note: Field 16 does not appear in AH, FH, and HU messages. Example: MILLSPAW FARM. This field is optional.

102.ALTNIndicator_918o

This field is the name of the alternate aerodrome(s), if ZZZZ is inserted in field 16. Note: Field 16 does not appear in AH, FH, and HU messages. Example: MILLSPAW FARM. This field is optional.

103.RALTIndicator_918p

This field is the name of the en route alternate aerodrome(s). An example: JB RANCH. This field is optional.

104.CODEIndicator_918q

This field shows the aircraft Controller-Pilot Data Link Communications (CPDLC) address. A sample: 45FA16. This field is optional.

105.RACEIndicator_918r

This field shows the requested altitude and speed en route. An example: KRAFT/M080F380. This field is optional.

106.SURIndicator_918s

This field shows surveillance applications or capabilities not specified in localIntendedRoute_10b (section 3.2.1.120). An example: 282B. This field is optional.

107.DLEIndicator_918t

This field indicates an en route delay or holding, and is new in ICAO 2012. It shows a significant point on the route where a delay is planned, followed by a time in the form hhmm. Example: MDG0030. This field is optional.

108.TALTIndicator_918u

This field shows ICAO four-letter indicator(s) for take-off alternate(s), in the form of an aerodrome name or any of the fix specifications (i.e., lat/long, fix-radial-distance, or name). This field is optional.

109.DOFIndicator_918v

This field is the date of flight departure in a six-figure format yymmdd. This field is optional.

110.ORGIndicator_918w

This field is the originator's eight-letter AFTN address or other appropriate contact details, in cases where the originator of the flight plan may not be readily identified, as required by the appropriate ATS authority. This field is optional.

111.PBNIndicator_918x

PBN stands for Performance Based Navigation. Up to eight two-character specifications may be included, for a total of 16 characters. The specifications are:

RNAV SPECIFICATIONS

- **A1** RNAV 10 (RNP 10)
- **B1** RNAV 5 all permitted sensors
- **B2** RNAV 5 GNSS
- **B3** RNAV 5 DME/DME
- **B4** RNAV 5 VOR/DME
- **B5** RNAV 5 INS or IRS
- **B6** RNAV 5 LORANC
- **C1** RNAV 2 all permitted sensors
- **C2** RNAV 2 GNSS
- **C3** RNAV 2 DME/DME
- **C4** RNAV 2 DME/DME/IRU
- **D1** RNAV 1 all permitted sensors
- **D2** RNAV 1 GNSS
- **D3** RNAV 1 DME/DME
- **D4** RNAV 1 DME/DME/IRU

RNP SPECIFICATIONS

- **L1** RNP 4
- **O1** Basic RNP 1 all permitted sensors
- **O2** Basic RNP 1 GNSS

- **O3** Basic RNP 1 DME/DME
- **O4** Basic RNP 1 DME/DME/IRU
- **S1** RNP APCH
- **S2** RNP APCH with BAR-VNAV
- **T1** RNP AR APCH with RF (special authorization required)
- **T2** RNP AR APCH without RF (special authorization required)

This field is optional.

112.ICAO1stAdaptedField18_999a

Fields 999a through 999y are the data that are present for the optionally adapted element 918 indicators that are transmitted to CMS, when applicable, using a Field Reference Number of **999**, with elements **a** through **y**. They are formatted as free-form text. These fields are optional.

113.ICAO2ndAdaptedField18_999b

114.ICAO3rdAdaptedField18_999c

115.ICAO4thAdaptedField18_999d

116.ICAO5thAdaptedField18_999e

117.ICAO6thAdaptedField18_999f

118.ICAO7thAdaptedField18_999g

119.ICAO8thAdaptedField18_999h

120.ICAO9thAdaptedField18_999i

121.ICAO10thAdaptedField18_999j

122.ICAO11thAdaptedField18_999k

123.ICAO12thAdaptedField18_999l

124.ICAO13thAdaptedField18_999m

125.ICAO14thAdaptedField18_999n

126.ICAO15thAdaptedField18_999o

127.ICAO16thAdaptedField18_999p

128.ICAO17thAdaptedField18_999q

129.ICAO18thAdaptedField18_999r

130.ICAO19thAdaptedField18_999s

131.ICAO20thAdaptedField18_999t

132.ICAO21stAdaptedField18_999u

133.ICAO22ndAdaptedField18_999v

134.ICAO23rdAdaptedField18_999w

135.ICAO24thAdaptedField18_999x

136.ICAO25thAdaptedField18_999y

137.lastSeqNo_245a

The ERAM sequence number of the last message received for a flight. Sequence number is part of field 00. Required.

138.lastFltMsgRcvd_245b

This element specifies the time the last message was received for a flight. Optional.

139.RNVArrival_925a

This field is the Area Navigation (RNAV) accuracy value for the arrival phase of the flight expressed in hundredths (.01) nm. The allowable range is 0001-9999. If the value is 0, the field is not included. Example: **0030**. This field is optional.

140.RNVEnroute_925b

This field is the Area Navigation (RNAV) accuracy value for the en route phase of the flight expressed in hundredths (.01) nm. The allowable range is 0001-9999. If the value is 0, the field is not included. Example: **0030**. This field is optional.

141.RNVOceanic_925c

This field is the Area Navigation (RNAV) accuracy value for the oceanic phase of the flight expressed in hundredths (.01) nm. The allowable range is 0001-9999. If the value is 0 then the field is not included. Example: **0030**. This field is optional.

142.RNVDeparture_925d

This field is the Area Navigation (RNAV) accuracy value for the departure phase of the flight expressed in hundredths (.01) nm. The allowable range is 0001-9999. If the value is 0, the field is not included. Example: **0030**. This field is optional.

143.RNVSpare1_925e

This is a spare field. This field is optional.

144.RNVSpare2_925f

This is a spare field. This field is optional.

145.tentativeFlightPlanIndicator_2459

This element indicates whether the flight plan data is from a tentative flight plan or not. Optional.

146.RNPArrival_925g

This field is the Required Navigation Performance (RNP) accuracy value for the arrival phase of the flight expressed in hundredths (.01) nm. The allowable range is 0001-9999. If the value is 0, the field is not included. Example: **0030**. This field is optional.

147.RNPEnroute_925h

This field is the Required Navigation Performance (RNP) accuracy value for the en route phase of the flight expressed in hundredths (.01) nm. The allowable range is 0001-9999. If the value is 0, the field is not included. Example: **0030**. This field is optional.

148.RNPOceanic_925i

This field is the Required Navigation Performance (RNP) accuracy value for the oceanic phase of the flight expressed in hundredths (.01) nm. The allowable range is 0001-9999. If the value is 0, the field is not included. Example: **0030**. This field is optional.

149.RNPDeparture_925j

This field is the Required Navigation Performance (RNP) accuracy value for the departure phase of the flight expressed in hundredths (.01) nm. The allowable range is 0001-9999. If the value is 0, the field is not included. Example: **0030**. This field is optional.

150.RNPSpare1_925k

This is a spare field. This field is optional.

151.RNPSpare2_925I

This is a spare field. This field is optional.

152.reconReportedAlt_2460

If the flight is active, this field contains the reported altitude from the last track message received for the flight.

153.cancellationIndicator_92b

This field is used to cancel the EDCT for an aircraft. It has a fixed value of C meaning that the flight is no longer part of a ground delay program.

154.ATCIntendedRoute_10c

The ATC Intended Route field is the current cleared flight plan route with any unacknowledged auto routes already applied. The ATC Intended Route includes to-be-applied AARs that are not to be notified in the current center. It is intended for clients that wish to know the currently expected route of the flight across contiguous ERAM airspace. Field 10c contains the filed route (field 10a) merged with any adapted routes (preferential routes, transition fixes and A-line fixes). Optional Field 10c will be sent to ATM-IPOP, when parameter Merged ATC Intended Route Switch (MARS) is ON and if either one of the following is true:

- If Field 10b exists and Field 10c is not the same as Field 10b
- If Field 10b does not exist and Field 10c is not the same as Field 10a (Flight Plan Route).

This field is optional.

155.flightPlanRouteRevNo_2468

This optional element specifies the flight plan route revision number.

156.clearanceRoute_2469

Field not used.

157.comNavApproachEquipICAO2012_910c

This field is the ICAO 2012 version of field 910a. The allowed values are:

- **N** – No equipment is carried, or equipment is unserviceable
- **S** – Standard equipment is carried and is serviceable
- **A** – GBAS landing system
- **B** – LPV (APV with SBAS)
- **C** – LORAN C

- **D** – DME
- **E1** – FMC WPR ACARS
- **E2** – D-FIS ACARS
- **E3** – PDC ACARS
- **F** – ADF
- **G** – GNSS
- **H** – HF RTF
- **I** – Inertial Navigation
- **J1** – CPDLC ATN VDL Mode 2
- **J2** – CPDLC FANS 1/A HDFL
- **J3** – CPDLC FANS 1/A VDL Mode A
- **J4** – CPDLC FANS 1/A VDL Mode 2
- **J5** – CPDLC FANS 1/A SATCOM (INMARSAT)
- **J6** – CPDLC FANS 1/A SATCOM (MTSAT)
- **J7** – CPDLC FANS 1/A SATCOM (Iridium)
- **K** – MLS
- **L** – ILS
- **M1** – ATC RTF SATCOM (INMARSAT)
- **M2** – ATC RTF SATCOM (MTSAT)
- **M3** – ATC RTF (Iridium)
- **O** – VOR
- **P1-P9** – Reserved for RCP
- **R** – PBN approved
- **T** – TACAN
- **U** – UHF RTF
- **V** – VHF RTF
- **W** – RVSM approved
- **X** – MNPS approved
- **Y** – VHF with 8.33 kHz spacing capacity
- **Z** – Other equipment carried

An example field: **ADE3RV**. This field is optional.

158.survEquipICAO2012_910d

This field is the ICAO 2012 version of field 910b. The possible values are:

- **N** – No surveillance equipment or equipment unserviceable
- **A** – Transponder Mode A
- **C** – Transponder Mode A and C
- **E** – Transponder – Mode S, including aircraft identification, pressure-altitude and extended squitter (ADS-B) capability
- **H** – Transponder – Mode S, including aircraft identification, pressure-altitude and enhanced surveillance capability
- **I** – Transponder – Mode S, including aircraft identification, but no pressure-altitude capability
- **L** – Transponder – Mode S, including aircraft identification, pressure-altitude, extended squitter (ADS-B) and enhanced surveillance capability
- **P** – Transponder – Mode S, including pressure-altitude, but no aircraft identification
- **S** – Transponder – Mode S, including both pressure-altitude and aircraft identification capability
- **X** – Transponder - Mode S with neither aircraft identification nor pressure-altitude capability
- **B1** – ADS-B with dedicated 1090 MHz ADS-B “out” capability
- **B2** – ADS-B with dedicated 1090 MHz ADS-B “out” and “in” capability
- **U1** – ADS-B “out” capability using UAT
- **U2** – ADS-B “out” AND “IN” capability using UAT
- **V1** – ADS-B “out” capability using VDL Mode 4
- **V2** – ADS-B “out” and “in” capability using VDL Mode 4
- **D1** – ADS-C with FANS 1/A capabilities
- **G1** – ADS-C with ATN capabilities

A sample field: **HB2U2V2G1** . This field is optional.

4.6 SFDPS Derived Messages Details

This chapter provides details for messages created by and distributed by SFDPS.

4.6.1 RReply Message

Response to a request for current flight data. Contains the latest flight plan data for a flight and the last track data if flight is active. RReply messages can either be represented as Simple Schema XML or FIXM format. The format to receive requested data in is configured in the web services request properties file for flight data requests.

1. Fields of FlightPlan

For details refer to section [4.1.1 Flight Plan Information \[FH\]](#).

2. groundSpeed_05b

This field is the ground speed in knots, in the form of three digits. Sample: 357.

3. reportedAlt_54a

This field shows the reported altitude. For aircraft with operative Mode C capability, Field 54a contains the Mode C altitude. For aircraft without Mode C capability or with non-operative Mode C capability, Field 54a may contain the controller-reported altitude. If there is no Mode C or controller-reported altitude, or the reported altitude is negative, Field 54a contains "0" or "000" or is optional. In the field format, one to three digits, is a numeric value between 0 and 999 which represents the aircraft altitude in hundreds of feet. Leading zeros are inserted for altitudes of less than 3 digits.

4. reportedAlt_54b

This field is the reported altitude B4 indicator. The ERAM controllers' full data block used for tracking an aircraft has a special indicator for the B4 character of the full data block. It is one character in length. Possible values are:

- **A** - Reported altitude (controller entered) equals single assigned altitude.
- **B** - Beacon reported altitude is in conformance or the controller-entered reported altitude is in the block for an aircraft which has been assigned an altitude block (B1 to B3 - low altitude limit of block and C1 to C3=high altitude limit of block).
- **C** - Beacon reported altitude is within Altitude Conformance Limits.
- **F** - Reported altitude (controller-entered) equals first altitude, or (beacon-reported) is within the Altitude Conformance Limits of first altitude when assigned altitude is (d)dd/fix/(d)dd and the first altitude is displayed in Field B.
- **N** - No beacon-reported altitude has been received for the aircraft; no controller-entered reported altitude exists for the aircraft; or the aircraft's rate of change is questionable and the Computed Rate of Change is being used to make further conformance checks.
- **T** - Interim altitude is currently being displayed in the assigned altitude field (B1 through B3).
- **V** - Beacon reported or controller entered reported altitude, when no assigned altitude exists for the aircraft.
- **X** - Beacon reported altitude becomes disestablished. (C1-C3 will also contain 'X' character.)
- **^** - Beacon-reported or controller-entered reported altitude is below the assigned altitude when the flight is climbing

- **v** - Beacon-reported or controller-entered reported altitude is above the assigned altitude when the flight is descending
- **+** - Beacon-reported altitude exceeds the upper conformance limit for an aircraft which has reached its assigned altitude, or (for a non-Mode C aircraft which has previously been reported at the assigned altitude) the controller entered reported altitude exceeds the assigned altitude.
- **–** - Beacon reported altitude is less than the lower conformance limit for an aircraft which has reached its assigned altitude or (for a non-Mode C aircraft which has previously been reported at the assigned altitude) the controller entered reported altitude is less than the assigned altitude.
- **/** - Flight type is 'OTP' or 'VFR'

5. **reportedAlt_54c**

This field is the reported altitude C4 indicator. The ERAM controllers' full data block used for tracking an aircraft has a special indicator for the C4 character of the full data block as follows: If the aircraft is not responding with the Mode C altitude, the controller entered reported altitude will be displayed in Field C with a pound sign (#) or **X** in position C4 whenever:

- (1) the controller-entered reported altitude does not equal the assigned altitude or is not within the assigned altitude block,
- (2) no assigned altitude has been entered, or
- (3) the assigned altitude is VFR, VFR/(d)dd, OTP, or OTP/(d)dd.

For either a Mode C-reported altitude or a controller-reported altitude, when an interim altitude is displayed in Field B the B4 character position will contain the letter "T" and the reported altitude; otherwise, either the lower or upper altitude of an assigned block altitude will be displayed in Field C. In the case where a controller-entered reported altitude exists, a pound sign (#) or **X** will be displayed in the C4 position. This field is optional.

6. **controllingFacility_138a**

This field shows the facility that is controlling the flight. Its format is three letters. An example: **ZCH**. This field is optional.

7. **controllingSector_138b**

This field shows the controlling ARTS position or the controlling ERAM ARTCC sector number. The Controlling Sector is the sector/position that is controlling the flight. The value will be **00** if identification of the controlling sector is not available. The format is one digit followed by one alphanumeric. For example: **1W**. This field is optional.

8. **receivingFacility_139a**

This field shows the facility that is receiving the flight. Its format is three letters. An example: **AIA**.

9. receivingSector_139b

This field shows the receiving ARTS position or the receiving ERAM ARTCC sector number. The receiving sector is the sector/position that is receiving the flight. The value will be **00** if identification of the receiving sector is not available. The format is one digit followed by one alphanumeric. For example: **1W**.

10. trackPosition_23d

This field shows the track position from ERAM to ATM-IPOP. It is a latitude/longitude pair, separated by a virgule, in the format ddddddL/dddL. For latitude, the first two digits are degrees, the second two are minutes, and the last two are seconds. The letter can be **N** or **S**. For the longitude, the first three digits are degrees, the second two are minutes, and the last two are seconds. The letter can be **E** or **W**. Example: **393106N/0842535W**.

11. trackVelocity_23e

This field shows the velocity and/or heading in nautical miles per hour. It has an X and a Y component separated by a forward slash. Either component can be preceded by either a + or – sign, followed by one to three digits. The second component can be preceded by an **S** or an **H**, for speed only (NM/hr), or heading only (degrees), respectively. Some examples: **+46/-355**, **-0/S439**.

12. coastIndicator_153a

This field is an action indicator. It has only one possible value, **C** for Coast. This field is optional.

13. timeOfTrackData_170a

This field is the date and time the track data was stored. It is saved in XML standard dateTime format. This field is optional.

14. targetPosition_171a

This field is the ERAM radar target position, in latitude/longitude format. This field is optional.

15. targetAlt_172a

This field is the Mode C target altitude (corrected for barometric pressure) in hundreds of feet. Its format is three digits, with leading zeros required. If the target altitude is negative, 172a will be 000. Example: 290. This field is optional.

16. targetAltInvalid_172b

If field targetAlt_172a is not valid, this field is set to INV. This field is optional.

17. timeOfTargetData_173a

This field is the date and time of the correlated target. It is saved in XML standard dateTime format. This field is optional.

4.6.2 SFDPS Status Message

Status messages could be sent to a customer:

- Periodically, indicating the status of the HADDs data feed from each ARTCC, time of the last sector status messages from each ARTCC, time of the last route status message from each ARTCC.
- When needed, indicating the status of SFDPS database and any reconstitution activities; when communication to HADDs is lost and restored, when the SFDPS data reconstitution starts and completes.

Some common fields will be used in all status messages while more specific fields will be only be present in the messages that they pertain to.

SFDPS Status messages are in the Simple Schema XML format.

1. Center

The ARTCC(s) associated with the status message, 'ALL', or 'NA' if not applicable. Required.

2. Classification

'Private' or 'Public' determines if the NEMS Interface passes the message to external data feeds. Required.

3. Time

Date and time in the XML standard format 'YYYY-MM-DDTHH:MM:SSZ' (ex. 2012-01-01T18:00:00Z). Required.

4. StatusType (required)

- **HADDs Connection:** indicates when the HADDs Interface makes a connection to a remote HADDs. This can be on initial startup or when the HADDs Interface receives instructions to switch to an alternate HADDs.
- **HADDs Disconnect:** indicates when the HADDs Interface disconnects from a remote HADDs. This can be on a system shutdown or when the HADDs Interface receives instructions to switch to an alternate HADDs.
- **HADDs Download Initiated:** indicates when the HADDs Interface initiates a reconstitution of data from a remote HADDs. This will occur on initial startup, when a client is first connected to the HADDs Interface, or when the HADDs Interface switches to an alternate HADDs.
- **HADDs Download Complete:** indicates when a reconstitution of data from a remote HADDs has completed.
- **HADDs Re-initialization Accepted:** sent when the HADDs Interface receives a re-initialize command from an approved internal process over its command interface port.

- **HADDs Interface Connection:** When an approved process makes an initial socket connection to the HADDs Interface it will send this message which will be followed by a triggered reconstitution of data. This is reserved for the XML Converter process.
- **Software Restart:** When the Monitor and Control process, SFDPS Monitor restarts a process due to a failure it will generate this status message that includes the affected process.
- **Software Status:** When the Monitor and Control process, SFDPS-Monitor checks each software process either related to a specific Center or to the system as a whole it will generate this status message. This can be considered a “heartbeat” for internal software that will be updated regularly.
- **ARTCC Status:** The Monitor and Control process, SFDPS-Monitor, will generate a “heartbeat” status message with the current state of each Center’s data flow on a regular basis.
- **NEMS Status:** The NEMS Interface will generate statistics relating to its connections to NEMS and report them to SFDPS as a status message.

5. Source

The process or component that generated the status message. Required.

6. ARTCC State

Used for “heartbeat” message listing status of each center. Each Center will have a state of “up”, “down”, or “unknown”.

7. Software

Used for “heartbeat” message listing status of software processes either Center-specific or system-wide. Each process will have a state of “up”, “down”, or “unknown”.

8. Process

In the case of a software restart, the process that was restarted.

9. Details

Additional details that may be of use to the recipient.

5. Helpful Hints

This chapter provides additional information that may be useful to a user, but not necessary belongs to any section above.

5.1 GUFİ Handling

Flight matching or flight data correlation is the process for determining which messages apply to which flights. This is a complex and difficult process, especially for systems receiving data from multiple sources. In support of and in attempt to improve flight matching, the concept of the Global Unique Flight Identified (GUFI) was created. The GUFI format was defined in FIXM 3.0 as conforming to the Universal Unique Identifier standard.

In the future the GUFI generation will be performed by a SWIM established GUFI Service. Until a GUFI Service is implemented, SFDPS needs to generate the FIXM GUFI on its own.

A sample of a FIXM GUFI (field `uuidGufi`): **2fed5f3f-fd87-49d2-aa41-1ca73564504d**.

The SFDPS Phase I system architecture requires two separate installations of SFDPS producers, a primary and a backup; both accept data, but only one publishes it. The databases at the two sites are distinct and do not share information. As a result FIXM GUFIs generated by each site for the same flight are different. Should a failover occur, the new primary site would publish a FIXM GUFI different from a GUFI generated by the old primary site for the same flight.

To deal with this situation a user can utilize the SFDPS GUFI, which is identical in both databases for the same flight. It will allow a user to maintain a consistent sequence of messages for a flight even in a case of a failover. The SFDPS GUFI is included in every message to positively identify what flight the message is for. The current SFDPS GUFI format consists of the country, the generator of the GUFI, the date-time the GUFI was created, and a sequence number to make GUFIs generated in the same second unique. The fields are separated by dots.

A sample of SFDPS GUFI (field `fdpsGufi`): **us.fdpS.2013-0821T14:36:58Z.612/10875/28**.

5.2 Message sequencing

NEMS does not preserve the ordering of messages. The JMS property, **FDPS_SequenceNo**, can be used to restore this ordering.

The property is included in every message. It contains a counter incremented separately for each source center every time SFDPS receives the message from that center. The counter will reset to zero when it exceeds its maximum value of 9,999,999,999 or when the process that generates it restarts. With these exceptions, all messages from a given center will contain an increasing value for this property.

5.3 Ambiguous FIXM entries

This section provides additional explanation for the mapping of CMS messages data fields to FIXM in cases where there was no direct or obvious correlation.

Data Field	Additional Information
eramGufi_316a, eramGufi_316aNum, eramGufi_316aDT	These fields are not used for FIXM mapping when they appear in the content of CMS messages. SFDPS populates flight/flightPlan/@identifier only from the eramGufi_316FPId element in the header section of an FDPMsg.
numberOfAircraft_03a	Special Aircraft Indicator from this field is being mapped to flight/aircraftDescription/@tfmsSpecialAircraftQualifier
Altitude related fields	According to ERAM documentation, these fields can either contain an altitude or a flight level, however the data fails to specify which it is. Specifically, the documentation describes the format of the altitude fields as "[the altitude in question] represents an altitude in hundreds of feet or a Flight Level in hundreds of feet". To resolve this ambiguity, SFDPS does not make use of the optional altitude attribute "ref" available in FIXM (which specifies mean sea level vs. flight level) when translating altitudes. While this solution allows SFDPS to translate this information to FIXM without risking an incorrect data transformation, this does pass the ambiguity on to the end user as the current ERAM feed does.
departurePoint_26a	<p>According to ERAM documentation, this field can either contain the departure airport or the airfile point (a fix, fix radial distance, or lat/lon) but the data fails to specify which it is.</p> <ul style="list-style-type: none"> • If it is a departure airport with an ICAO code, it should be mapped to flight/departure/departureAerodrome/@code (where departureAerodrome is an instantiation of IcaoAerodromeReferenceType). • If it is an airfile, it could be mapped to flight/departure/departureAerodrome/point (where departureAerodrome is an instantiation of UnlistedAerodromeType and point houses the fix, fix radial distance, or lat/lon). • Lastly, if it is an airport without an ICAO code, it could go to flight/departure/departureAerodrome/@name (where departureAerodrome is an instantiation of UnlistedAerodromeType). <p>While a fix radial distance and lat/lon are easy to recognize via pattern matching, distinguishing other fields would appear to require adaptation files SFDPS does not currently have access to.</p> <p>To resolve this ambiguity with the input data, SFDPS instead mapped this value to flight/departure/@departurePoint. While the free-text nature of this field allows SFDPS to translate this information to FIXM without risking an incorrect data transformation, this does pass the ambiguity on to the end user as the current ERAM feed does.</p>
destination_27a	This field suffers similar ambiguity issues to 26a above as ERAM documentation indicates it can either be an airport name or a significant point with no pattern-based means to distinguish between fixes and airport names. For this reason and for symmetry, SFDPS uses flight/arrival/@arrivalPoint rather than flight/arrival/arrivalAerodrome.
flightRules_908a	FIXM only allows two of the four flight rules values: IFR and VFR. For the remaining two, SFDPS maps "IFR First" to IFR and "VFR First" to VFR.

Data Field	Additional Information
altAero_916c	This field suffers the same airport name vs. significant point ambiguity described in 26a and 27a above but there is no departurePoint/arrivalPoint equivalent currently available in the FIXM Core or U.S. extension schemas to side step this problem. As such, a best effort was made to map this field correctly. The assumption was made that these would most likely be ICAO airport codes so, if the pattern matched [A-Z]{4}, the value was mapped to flight/departure/departureAerodrome/@code (where departureAerodrome is an instantiation of IcaoAerodromeReferenceType). Otherwise the value was parsed as a significant point and mapped to flight/departure/departureAerodrome/point (where departureAerodrome is an instantiation of UnlistedAerodromeType and point houses the fix, fix radial distance, or lat/lon).
OPRIndicator_918f	ERAM documentation simply describes this field as "Aircraft Operator". FIXM requires further specification, identifying the operator as a person or an organization. Without further information, it does not seem possible to distinguish between the two so the assumption was made that this field would most often contain an organization. As such, it is mapped to flight/operator/operatingOrganization/organization/@name.
DEPIndicator_918m	This fields corresponds to ICAO field 18/DEP and therefore should contain the name and location of departure aerodrome where the location is expressed either as a latitude/longitude or as a bearing and distance from a named fix. When processing this field, SFDPS followed the guidelines laid out in the ATS Message Content to FIXM Logical Model Map document available on the FIXM website. This document suggests that the content of this field tends to be unreliably organized and suggests best practices for parsing it.
DESTIndicator_918n	SFDPS handles this field in the same fashion as 918m above.
ALTNIndicator_918o	SFDPS handles this field in the same fashion as 918m above.
RALTIndicator_918p	SFDPS handles this field in the same fashion as 918m above.
TALTIndicator_918u	SFDPS handles this field in the same fashion as 918m above.
ORGNIndicator_918w	According to ERAM documentation, this field can either be an AFTN address or other significant contact details. If the pattern of this field matches eight letters, SFDPS maps the value to flight/originator/aftnAddress. Otherwise the value is mapped to flight/originator/flightOriginator.
arrivalTime_28b	According to ERAM documentation, this field is formatted as Ldddd where dddd = hhmm (hours and minutes of the arrival time). All FIXM times need to be fully qualified with the date as well as the time. SFDPS attempts to resolve this ambiguity and assign the correct date to the given time. This fully qualified time is then mapped to flight/arrival/runwayPositionAndTime/runwayTime/actual/@time.
cancellationIndicator_92b	The incoming data includes this cancellation indicator but FIXM has no explicit way of representing this important field. The current method used by SFDPS to handle this issue is to map this value to flight/departure/runwayPositionAndTime/runwayTime/controlled (the same element the EDCT is mapped to) but force this nillable element to be marked with nil="true" to indicate it has been cancelled.

Data Field	Additional Information
mergedFPStatus_339a, computerId_02d, and sspld_167a	The field mergedFPStatus_339a is not mapped directly into FIXM. However it is used to determine the mapping of computerId_02d and sspld_167a. Within the context of an NL message, these two fields can be mapped either to flight/flightIdentification/@computerId and flight/flightIdentification/@siteSpecificPlanId for any value of mergedFPStatus_339a other than "D" or flight/flightIdentificationPrevious/@computerId and flight/flightIdentificationPrevious/@siteSpecificPlanId if mergedFPStatus_339a is set to "D".
timeBtw1stAndLastConverted RouteFix_2449	This field is mapped to flight/agreed/route/@flightDuration but only when ETE_2439 is not set.
arrivalTime	This field is mapped to either flight/arrival/runwayPositionAndTime/runwayTime/estimated/@time or flight/arrival/runwayPositionAndTime/runwayTime/actual/@time based on the flightState (<i>actual</i> is only used if flightState is "Landed").
departureTime	This field is mapped to either flight/departure/runwayPositionAndTime/runwayTime/estimated/@time or flight/departure/runwayPositionAndTime/runwayTime/actual/@time based on the flightState (<i>actual</i> is only used if flightState is not "Proposed" or "Cancelled").

6. SFDPS Connect Application and Development

SFDPS Connect v2.1.3 is an application that enables a SWIM subscriber to access SFDPS data. It connects to NEMS, subscribes to receive data, and logs the received XML formatted data in files. It also sends requests to one of four SFDPS web services and receives the resulting messages through the NEMS connection. SFDPS Connects to NEMS via an ActiveMQ JMS client connection to access the internal feed or via a Solace JMS connection to access the external feed.

The SFDPS Connect v2.1.3 application source code and supporting files are provided for users who may wish to develop their own application to connect and receive SFDPS data.

6.1 Software Requirements

The following are software requirements for development:

- Java 1.8.0_45 64-bit (<http://www.oracle.com/technetwork/java/index.html>)¹

The following are optional software. SFDPS Connect v2.1.3 development used this listed software:

- Windows 7 64-bit (Service Pack 1)
- Eclipse Java EE IDE for Web Developers. Version: Luna Service Release 1 (4.4.1) Build id: 20140925-1800 (<https://eclipse.org/downloads/>)
- Maven 3.3.3 (<https://maven.apache.org>) (for build automation)
- Perl 5.10.1 (for creating user installation package)

SFDPS Connect v2.1.3 was developed and tested using the following:

- RedHat Linux 6.1 (kernel 2.6.32-131.0.15.el6.x86_64)

¹ When run, SFDPS Connect will check the current Java version against the minimum supported version of 1.8.0_45. If it is of a lower version, SFDPS Connect will display an error message and exit.

6.2 Installation

The SFDPS Connect v2.1.3 source is provided in the following installation file:

- SFDPSConnect-v2.1.3-Source.tar

Unpack the file into a folder of your choice. This creates an *SFDPSConnect-v2.1.3* folder. This folder contains the following sub-folders:

Folder Name	Description
build	Empty when installed. Intended to contain the runtime environment and installation package TAR file after the software is built.
config	Folder containing configuration property files used by SFDPS Connect.
doc	Javadoc for SFDPS Connect packages.
lib	JAR files used in SFDPS Connect development.
repo	Local repository for dependencies. Used by Maven when building the software. Note that this folder also contains a sample maven settings.xml.sample file that maven users can customize and use. Please read this file for more details. This sample can be used to connect to the FAA SWIM COTS Repo which contains all the required libraries for SFDPS Connect.
src	Parent folder containing source code, configuration property files, and other supporting files.
src/main/java/gov/dot/faa/enroute/fdps/connect	Folder containing the source code for SFDPSConnect.
src/main/resources	Folder containing the Simple Schema schema and bindings files.
src/main/scripts	Folder containing scripts used to run SFDPSConnect.
src/test	Contains unit testing source code for SFDPSConnect.
target	Folder containing files generated after running the automated build using Maven. This folder and the generated JAR file for the application will appear here after running the build.

Also unpacked at the top level are the following files:

Folder Name	Description
create_installation.pl	Perl script to create the installation TAR file after the program JAR is built.
pom.xml	Maven POM file used to build the SFDPS Connect executable JAR file.
README.txt	Contains a summary of details relevant to developing the SFDPS Connect application.

The unpacked files and folders can be imported into a development environment such as Eclipse.

6.3 Project Environment

The installation provides a project environment that is ready for development. The project environment by default is a Maven project and can be built using Maven. Alternatively, developers can import the project into an IDE such as Eclipse and develop from there.

6.3.1 Maven Project Environment

The installation provides as a default, a Maven project which can be developed on at the command line terminal level. This project can also be imported into any preferred IDE. Doing this may require a Maven plugin for the IDE. How to setup Maven compatibility in the IDE of choice is beyond the scope of this documentation.

6.3.2 Eclipse Project Environment

The provided development environment can be imported into Eclipse IDE without creating a project or using Maven. The following are the steps involved:

1. (Optional) Copy the SFDPS Connect project folder from *SFDPSConnect-v2.1.3* into the Eclipse workspace folder (usually called *workspace* as default).
2. Select File->Import. Click “Next”.
3. Select General->Existing Projects Into Workspace. Refer to Figure 6-1. Click Next.

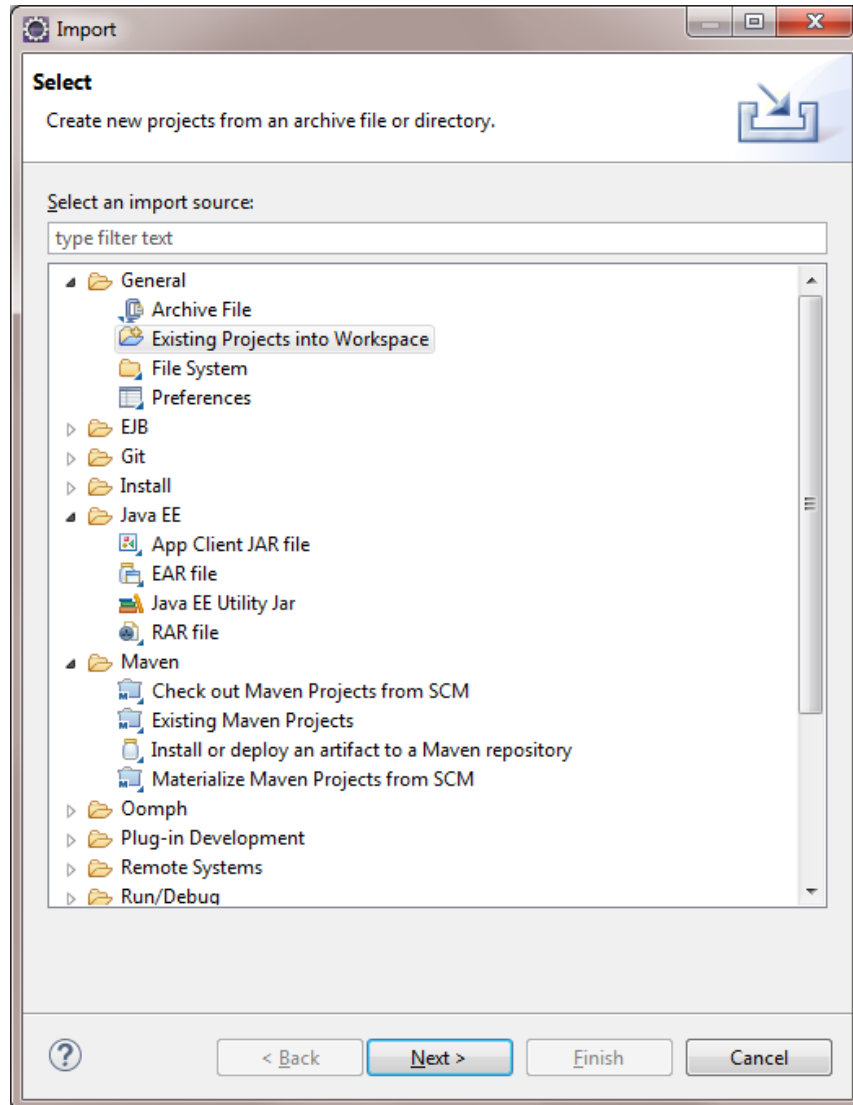


Figure 6-1: Importing Existing Project Into Workspace in Eclipse IDE

4. Select “Root Directory” and browse to the folder containing the project to import. Select the *SFDPSConnect-v2.1.3* folder. (The project should appear checked under “Projects”.)
5. Click finish. The resulting project should appear as in Figure 6-2.

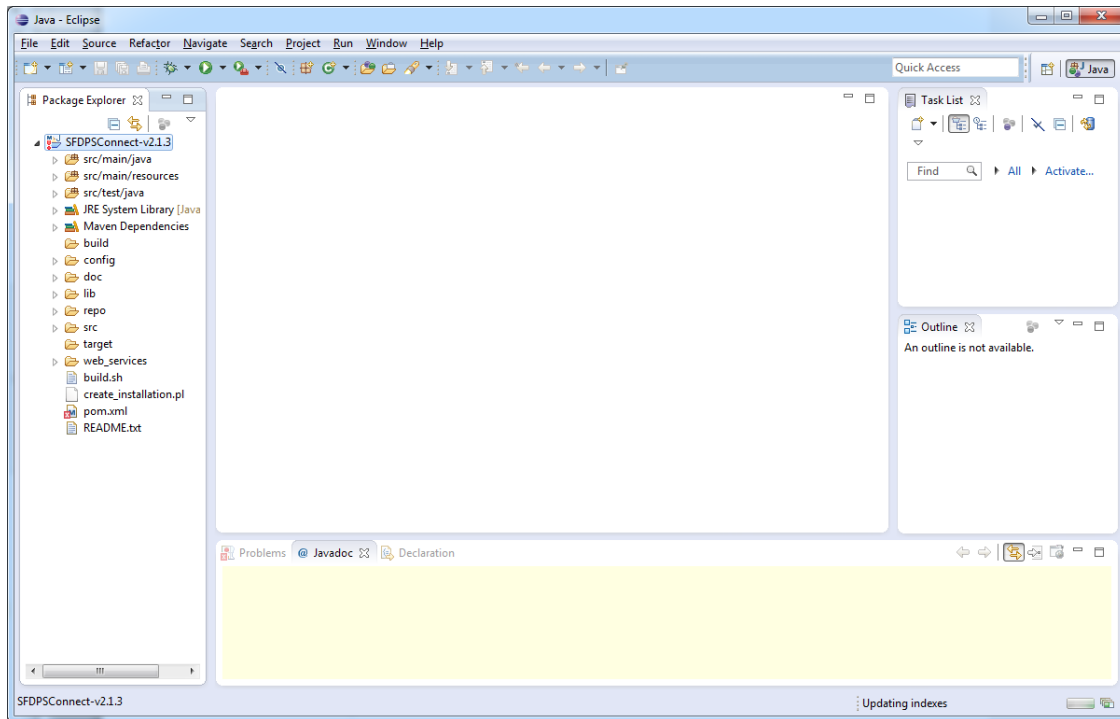


Figure 6-2: SFDPS Connect Project in Eclipse IDE

Note:

Ensure you are using at the minimum, the version of Eclipse IDE specified. Some older versions of Eclipse may result in errors or require further configuration to the development environment. Also, ensure that Java 1.8.0_45 64-bit is installed and that you can set the compiler compliance level to 1.8.

6.4 Development

In Eclipse, the package explorer on left can be used to navigate the files and folders of the project. For details regarding the packages, files, and folders of the SFDPS Connect v2.1.3 project, refer to Appendix D.

Web services functionality are defined in the web_services package. The web services clients for airspace data, flight data, general messages, and operational data are created from SFDPS specific WSDL files. The source code implementing these clients are pre-generated using the wsdl2java Axis plug-in for Eclipse IDE, and provided as part of the development environment. The WSDL files used to generate this code are not provided as part of the package as they are never intended to be modified for purposes outside of core SFDPS development.

Javadoc for the SFDPS Connect is also available. It can be accessed by opening the *index.html* file in the *doc* folder in a web browser.

Note:

Warnings appear in the generated web service client packages. The packages were created using wsdl2java Axis plug-in for Eclipse IDE. The warnings can be suppressed. They do not affect the functionality of the web service clients in SFDPS Connect v2.1.3.

6.5 Building the SFDPS Connect Application

6.5.1 Building Using the Maven

Maven 3.3.3 is used to build the SFDPS Connect. The pom.xml is already configured for building the application. From the *SFDPSConnect-v2.1.3* folder, run the following command at the command line terminal:

```
> mvn clean compile assembly:single
```

This will run the Maven build and produce an executable JAR file in the *SFDPSConnect-v2.1.3/target* folder called: *SFDPSConnect-2.1.3-jar-with-dependencies.jar*

6.5.2 Building Using Eclipse

Eclipse IDE can be used to build the software. There are three stages to building an executable JAR for SFDPS Connect in Eclipse. The build paths and run configurations setup are one-time processes. Once these are set, the actual building of the runnable JAR file can be repeated.

Setup the Build Paths:

1. Right click on the project.
2. Select “Properties”.
3. Select “Java Build Path”.
4. Select the “Libraries” tab.
5. Click on “Add JARs”.
6. Browse to the “lib” folder and select all of the JARs in this folder. They should appear as listed in Figure 6-3.

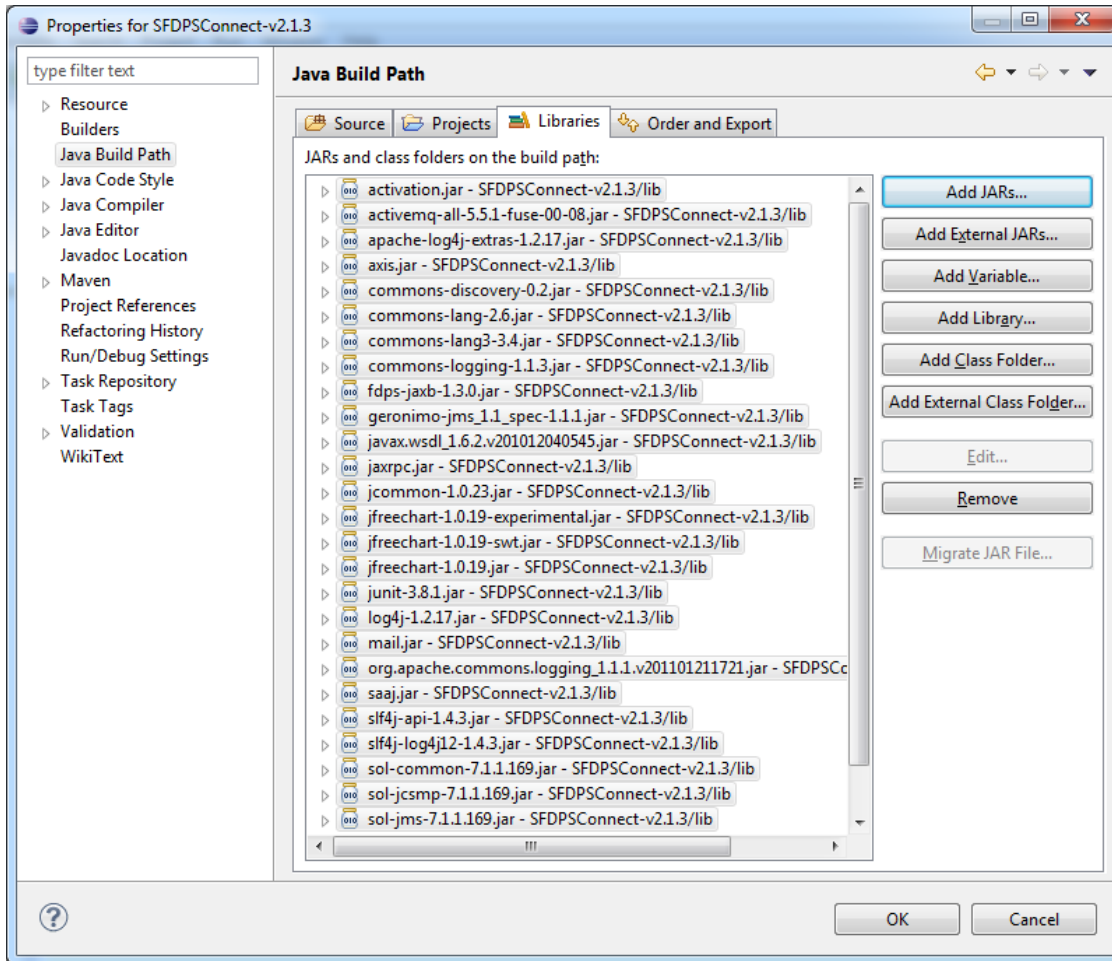


Figure 6-3: Added JARs to the Java Build Path

7. Click “Ok”.

Create Run Configuration:

1. Select “Run” from the menu.
2. Select “Run Configurations”.
3. In the list of configurations on the left, double click “Java Application”.
4. Fill in the details of the Java run configuration:
5. Change the name to “SFDPSConnect”.
6. Ensure that the project defined is “SFDPSConnect-v2.1.3”.
7. Specify the “Main class” by searching for “SFDPSConnect” in the list.

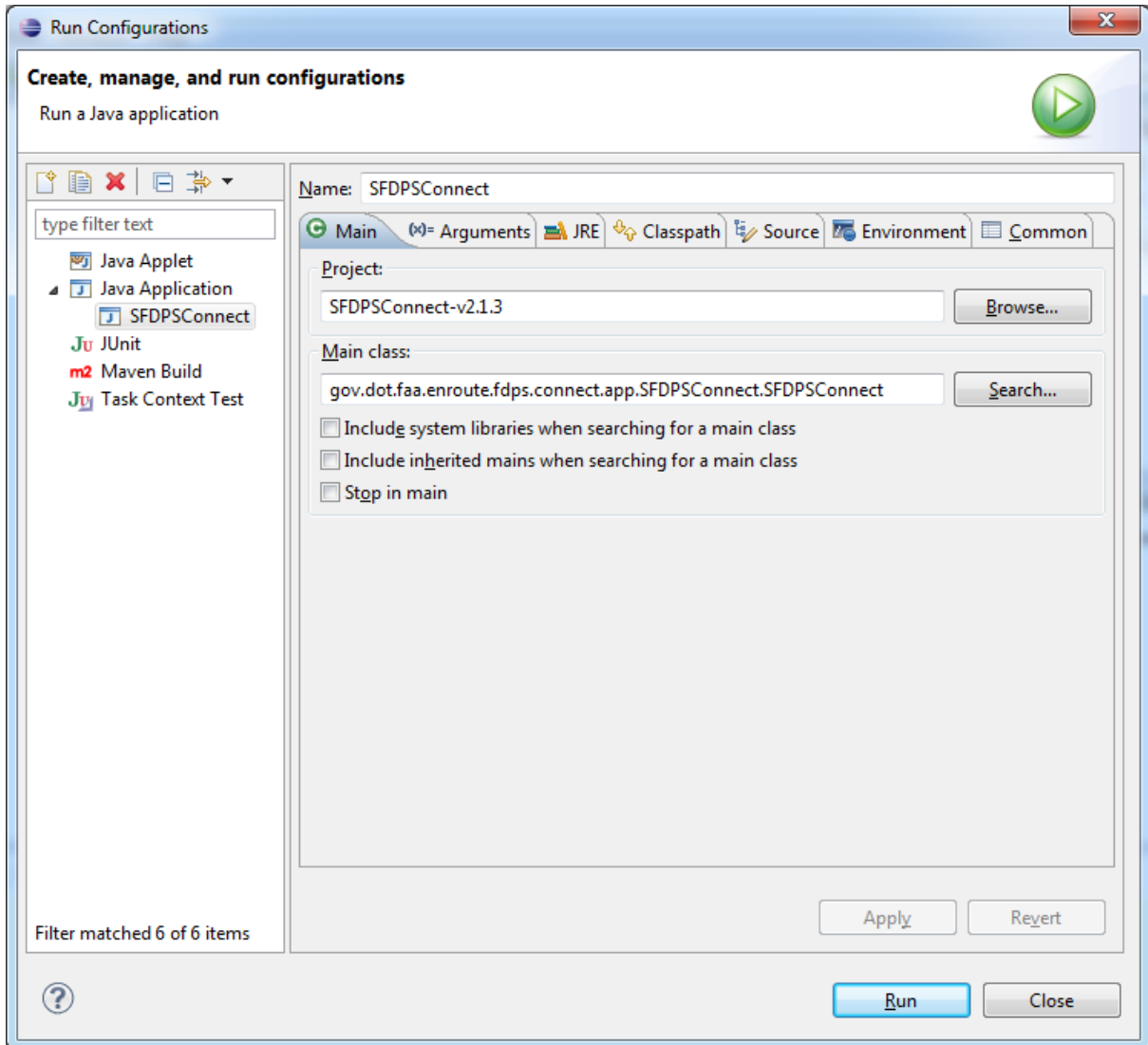


Figure 6-4: Run Configuration Setup

8. Click “Apply” and “Close”.

Build Runnable JAR File:

1. Go to File->Export and expand the “Java” folder.
2. Select “Runnable JAR file”.

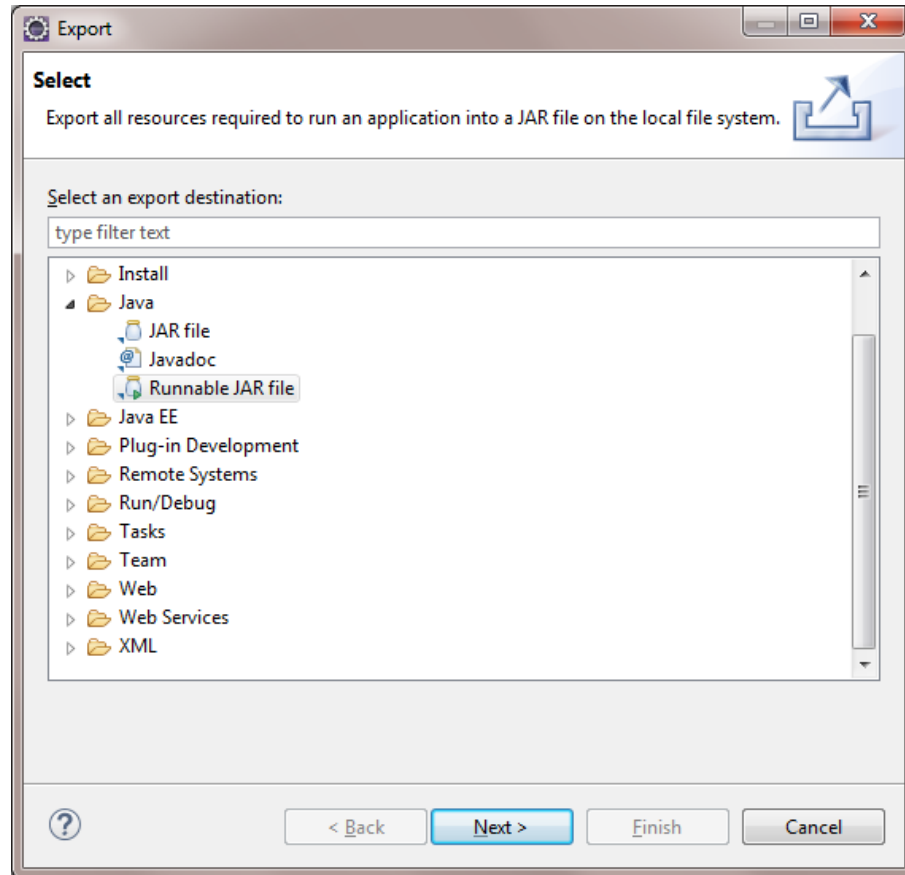


Figure 6-5: Selecting Runnable JAR File Option

3. Click “Next”.
4. Set the launch configuration to “SFDPSConnect”.
5. Browse to an export directory where the built JAR file will be created in.
6. Set the resulting JAR file name to “SFDPSConnect.jar”.

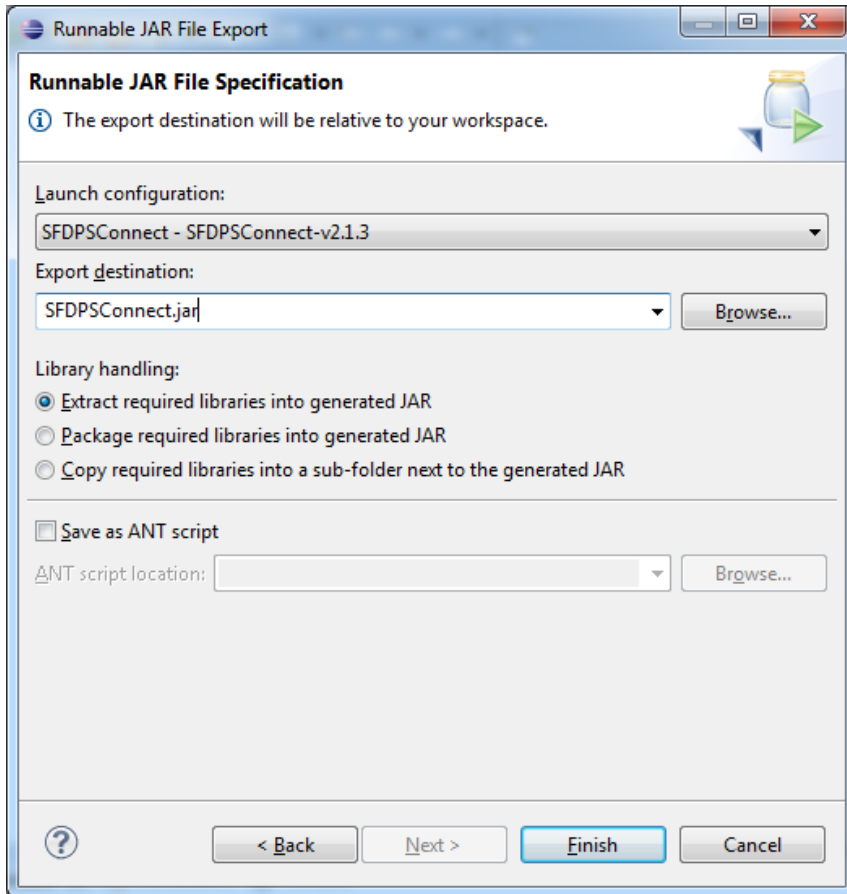


Figure 6-6: Setting Up Details of the Runnable JAR File

7. Click “Finish”.
8. Browse to the export directory to obtain the newly built JAR file.

6.6 Creating the SFDPS Connect Installation Package

When the SFDPS Connect is built using Maven, files will be generated in the *target* folder. The generated JAR file is named: *SFDPSConnect-2.1.3-jar-with-dependencies.jar*. This file is included in the generated installation package TAR file but renamed to **SFDPSConnect.jar**.

A Perl script is provided in the *SFDPSConnect-v2.1.3* folder. The script is called “create_installation.pl” and it will create a TAR file containing the SFDPS Connect application execution environment and required files.

To generate the TAR file, run the script as follows:

> perl create_installation.pl

The *build* folder will contain the file: **SFDPSConnect-Release-2-1-3-mmddyyyy.tgz** (where: mmddyyyy = month, day, year of the build)

.

6.7 Running the SFDPS Connect Application

Developers can run the software directly from Eclipse.

1. Select Run->Run Configurations. This will launch the Run Configuration box.
2. Select the “Arguments” tab. Enter the command line parameters for the application. Enter one of the following depending on what is to be run.

-psa config/sfdps-connect-pubSub.properties for Pub-Sub mode (ActiveMQ)
-pss config/sfdps-connect-pubSub.properties for Pub-Sub mode (Solace)
-psang config/sfdps-connect-pubSub.properties for Pub-Sub mode (ActiveMQ, no-GUI)
-pssng config/sfdps-connect-pubSub.properties for Pub-Sub mode (Solace, no-GUI)
-rra config/sfdps-connect-reqRes.properties for Request/Response mode (ActiveMQ)
-rrs config/sfdps-connect-reqRes.properties for Request/Response mode (Solace)

Refer to Figure 6-7 for an example of the run configuration setup screen.

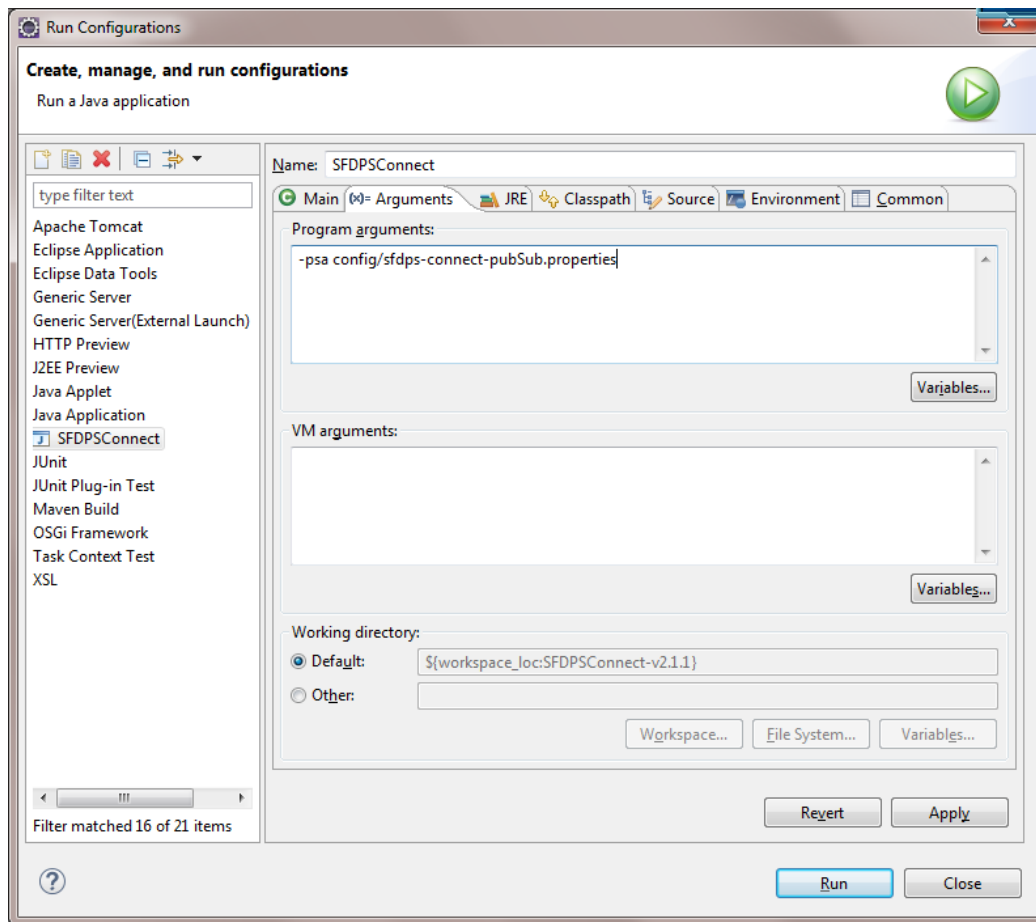


Figure 6-7: Setting Up The Run Configuration

3. Click “Run” to launch SFDPS Connect. (Alternatively, the green colored arrow button in the main Eclipse window can also be used to launch the software.) The console in Eclipse will show system messages while running SFDPS Connect.

Running SFDPS Connect will create data, data-reply, stats, and trace folders containing log files generated during program execution. These will get created in the project folder..

Note:

Multiple run configurations can be defined for each of the combination of executable modes. This is done by giving each run configuration a unique name.

Please refer to *SFDPS Connect User Guide v2.1.3* for instructions regarding how to configure and run the SFDPS Connect application in the actual runtime environment. Refer to Appendix E for a list of supported configuration properties. Refer to Appendix F for a list of executable modes.

Appendix A: Acronyms

ARTCC	Air Route Traffic Control Center
ARTS	Automated Radar Terminal System
ATM	Air Traffic Management
CID	Computer ID
CMS	Common Message Set
DBRT	Database Record Transfer
ERADP	En Route Airspace Data Publication
ERAM	En Route Automation Modernization
ERFDP	En Route Flight Data Publication
ERGMP	En Route General Messaging Publication
ERODP	En Route Operational Data Publication
ESB	Enterprise Service Bus
FAA	Federal Aviation Administration
FDPS	Flight Data Publication Service (now referred to as SFDPS)
FIXM	Flight Information Exchange Model
GUFID	Globally Unique Flight Identifier
HADDS	Host Application Data Distribution System
HDFS	Hadoop Distributed File System
HTTP(S)	HyperText Transfer Protocol (Secure)
ICAO	International Civil Aviation Organization
IDE	Integrated Development Environment
IP	Internet Protocol
IPOP	Intermediate Point Of Presence
JAXB	Java Architecture for XML Binding
JMS	Java Messaging Service
NAS	National Airspace
NEMC	Network Enterprise Management Center
NEMS	NAS Enterprise Messaging Service
Pub-Sub	Publish-Subscribe
Req-Res	Request-Response
SAA	Special Activity Airspace
SFDPS	SWIM Flight Data Publication Service
SOAP	Simple Object Access Protocol
SSPID	Site Specific Plan Identifier
STARS	Standard Terminal Automation Replacement System
SWIM	System Wide Information Management
TBD	To Be Done / To be Determined
TCP/IP	Transmission Control Protocol/Internet Protocol
TFMS	Traffic Flow Management System
WSDL	Web Services Description Language
XML	eXtensible Markup Language
XSD	XML Schema Definition

Appendix B: Mapping to FIXM Schema

This section provides details of how to map elements of SDPS Simple Schema XML Flight message to FIXM standard. Note, with the addition of SFDPS derived information, Simple Schema XML contains one to one XML representation of CMS messages.

In addition [Section 5.3](#) contains helpful information for cases when mapping was not obvious.

FDPS Message

Simple Schema	FIXM 3.0 with U.S. Extension (Extension use marked in blue)
propSourceSystem	flight/@system
propFlightOperator	flight/operator/operatingOrganization/organization/@name
propOrigin	flight/departure/@departurePoint
propDestination	flight/arrival/@arrivalPoint
propRcvdTime	flight/@timestamp
propSeqNo	flight/supplementalData/additionalFlightInformation/nameValue/@name flight/supplementalData/additionalFlightInformation/nameValue/@value
center	flight/@centre
arrivalTime	flight/arrival/runwayPositionAndTime/runwayTime/[actual estimated]/@time
arrivalTimeEpoch	Not Used
departureTime	flight/departure/runwayPositionAndTime/runwayTime/[actual estimated]/@time
departureTimeEpoch	Not Used
flightState	flight/flightStatus/@fdpsFlightStatus
flightStateActiveOrProposed	Not Used
fdpsGufi	flight/supplementalData/additionalFlightInformation/nameValue/@name flight/supplementalData/additionalFlightInformation/nameValue/@value
eramGufi_316a0	Not Used
eramGufi_316aFPId	flight/flightPlan/@identifier
eramGufi_316aDT	Not Used
flightPlanSeqNo	flight/supplementalData/additionalFlightInformation/nameValue/@name flight/supplementalData/additionalFlightInformation/nameValue/@value
uuidGufi	flight/gufi

Flight Plan [FH], Flight Amendment [AH], Flight Update [HU]

Simple Schema	FIXM 3.0 with U.S. Extension (Extension use marked in blue)
sourceId_00e	Not Used
sourceTime_00e1	Not Used
sourceSeqNo_00e2	Not Used

Simple Schema	FIXM 3.0 with U.S. Extension (Extension use marked in blue)
flightId_02a	flight/flightIdentification/@aircraftIdentification flight/supplementalData/additionalFlightInformation/nameValue/@name flight/supplementalData/additionalFlightInformation/nameValue/@value
computerId_02d	flight/flightIdentification/@computerId
eramGufi_316a	Not Used
eramGufi_316aNum	Not Used
eramGufi_316aDT	Not Used
sspld_167a	flight/flightIdentification/@siteSpecificPlanId
numberOfAircraft_03a	flight/aircraftDescription/@aircraftQuantity flight/aircraftDescription/@tfmsSpecialAircraftQualifier
typeOfAircraft_03c	flight/aircraftDescription/aircraftType/icaoModelIdentifier
airborneEquip_03e	flight/aircraftDescription/@equipmentQualifier
beaconCode_04a	flight/enRoute/beaconCodeAssignment/currentBeaconCode
externalBeaconCode_04b	flight/enRoute/beaconCodeAssignment/reassignedBeaconCode
trueAirSpeed_05a	flight/requestedAirspeed/nasAirspeed flight/requestedAirspeed/@uom
machSpeed_05c	flight/requestedAirspeed/nasAirspeed flight/requestedAirspeed/@uom
classifiedSpeed_05d	flight/requestedAirspeed/classified
coordFix_06a	flight/coordination/coordinationFix/@fix
coordStatusTime_07d	Not Used
coordStatus_07d1	flight/coordination/@coordinationTimeHandling
coordTime_07d2	flight/coordination/@coordinationTime
delayTime_07e	flight/coordination/@delayTimeToAbsorb
assignedAlt_08a	flight/assignedAltitude/simple flight/assignedAltitude/simple/@uom
assignedAlt_08b	flight/assignedAltitude/vfrOnTop
assignedAlt_08c	flight/assignedAltitude/vfrOnTopPlus flight/assignedAltitude/vfrOnTopPlus/@uom
assignedAlt_08d	flight/assignedAltitude/block/above flight/assignedAltitude/block/above/@uom flight/assignedAltitude/block/below flight/assignedAltitude/block/below/@uom
assignedAlt_08e	flight/assignedAltitude/above flight/assignedAltitude/above/@uom

Simple Schema	FIXM 3.0 with U.S. Extension (Extension use marked in blue)
assignedAlt_08f	flight/assignedAltitude/altFixAlt/point flight/assignedAltitude/altFixAlt/post flight/assignedAltitude/altFixAlt/post/@uom flight/assignedAltitude/altFixAlt/pre flight/assignedAltitude/altFixAlt/pre/@uom
assignedAlt_08g	flight/assignedAltitude/vfr
assignedAlt_08h	flight/assignedAltitude/vfrPlus flight/assignedAltitude/vfrPlus/@uom
requestedAlt_09a	flight/requestedAltitude/simple flight/requestedAltitude/simple/@uom
requestedAlt_09b	flight/requestedAltitude/vfrOnTop
requestedAlt_09c	flight/requestedAltitude/vfrOnTopPlus flight/requestedAltitude/vfrOnTopPlus/@uom
requestedAlt_09d	flight/requestedAltitude/above flight/requestedAltitude/above/@uom
requestedAlt_09e	flight/requestedAltitude/block/above flight/requestedAltitude/block/above/@uom flight/requestedAltitude/block/below flight/requestedAltitude/block/below/@uom
requestedAlt_09f	flight/requestedAltitude/vfr
requestedAlt_09g	flight/requestedAltitude/vfrPlus flight/requestedAltitude/vfrPlus/@uom
flightPlanRoute_10a	flight/agreed/route/@nasRouteText
departurePoint_26a	flight/departure/@departurePoint
destination_27a	flight/arrival/@arrivalPoint
FPA_143a0	Not Used
FPA_143a1	Not Used
FPA_143a2	Not Used
FPA_143a3	Not Used
FAV_143b0	flight/agreed/route/nasadaptedArrivalRoute/nasFavNumber
FAV_143b1	flight/agreed/route/nasadaptedArrivalRoute/nasFavNumber
FAV_143b2	flight/agreed/route/nasadaptedArrivalRoute/nasFavNumber
FAV_143b3	flight/agreed/route/nasadaptedArrivalRoute/nasFavNumber
ADARId_141a	flight/agreed/route/adaptedArrivalDepartureRoute/@nasRouteIdentifier
ADRIId_141b	flight/agreed/route/adaptedDepartureRoute/@nasRouteIdentifier
AARId_141c	flight/agreed/route/nasadaptedArrivalRoute/@nasRouteIdentifier
ADARFId10_142a	flight/agreed/route/adaptedArrivalDepartureRoute/@nasRouteAlphanumeric
ADARNonFId10_142b	flight/agreed/route/adaptedArrivalDepartureRoute/@nasRouteAlphanumeric
ADRFId10_142c	flight/agreed/route/adaptedDepartureRoute/@nasRouteAlphanumeric
ADRNNonFId10_142d	flight/agreed/route/adaptedDepartureRoute/@nasRouteAlphanumeric

Simple Schema	FIXM 3.0 with U.S. Extension (Extension use marked in blue)
AARFId10_142e	flight/agreed/route/nasadaptedArrivalRoute/@nasRouteAlphanumeric
AARNonFId10_142f	flight/agreed/route/nasadaptedArrivalRoute/@nasRouteAlphanumeric
remarks_11c	flight/flightPlan/@flightPlanRemarks
flightRules_908a	flight/agreed/route/@initialFlightRules
typeOfFlight_908b	flight/@flightType
wakeTurbulenceCat_909c	flight/aircraftDescription/@wakeTurbulence
comNavApproachEquip_910a	Not Used
survEquip_910b	Not Used
comNavApproachEquipICAO2012_910c	flight/aircraftDescription/capabilities/@standardCapabilities flight/aircraftDescription/capabilities/communication/communicationCode flight/aircraftDescription/capabilities/communication/dataLinkCode flight/aircraftDescription/capabilities/navigation/navigationCode
survEquipICAO2012_910d	flight/aircraftDescription/capabilities/surveillance/surveillanceCode
altAero_916c	flight/arrival/arrivalAerodromeAlternate/@code or flight/arrival/arrivalAerodromeAlternate/point
ICAOSToredFormat_918a	Not Used
EETIndicator_918b	flight/agreed/route/estimatedElapsedTime/location flight/agreed/route/estimatedElapsedTime/@elapsedTime
RIFIndicator_918c	flight/routeToRevisedDestination/route/@routeText
REGIndicator_918d	flight/aircraftDescription/@registration
SELIndicator_918e	flight/aircraftDescription/capabilities/communication/@selectiveCallingCode
OPRIndicator_918f	flight/operator/operatingOrganization/organization/@name
STSIndicator_918g	flight/specialHandling
TYPIIndicator_918h	flight/aircraftDescription/aircraftType/otherModelData
PERIndicator_918i	flight/aircraftDescription/@aircraftPerformance
COMIndicator_918j	flight/aircraftDescription/capabilities/communication/ @otherCommunicationCapabilities
DATIndicator_918k	flight/aircraftDescription/capabilities/communication/ @otherDataLinkCapabilities
NAVIndicator_918l	flight/aircraftDescription/capabilities/navigation/ @otherNavigationCapabilities
DEPIndicator_918m	flight/departure/departureAerodrome/@name flight/departure/departureAerodrome/point
DESTIndicator_918n	flight/arrival/arrivalAerodrome/@name flight/arrival/arrivalAerodrome/point

Simple Schema	FIXM 3.0 with U.S. Extension (Extension use marked in blue)
ALTNIndicator_918o	flight/arrival/arrivalAerodromeAlternate/@name flight/arrival/arrivalAerodromeAlternate/point
RALTIndicator_918p	flight/enRoute/alternateAerodrome/@name flight/enRoute/alternateAerodrome/point or flight/enRoute/alternateAerodrome/@code
CODEIndicator_918q	flight/aircraftDescription/@aircraftAddress
RACEIndicator_918r	Not Used
SURIndicator_918s	flight/aircraftDescription/capabilities/surveillance/ @otherSurveillanceCapabilities
DLEIndicator_918t	flight/agreed/route/segment/routePoint/point flight/agreed/route/segment/routePoint/@delayAtPoint
TALTIndicator_918u	flight/departure/takeoffAlternateAerodrome
DOFIndicator_918v	Not Used
ORGNIndicator_918w	flight/originator/aftnAddress flight/originator/flightOriginator
PBNIndicator_918x	flight/aircraftDescription/capabilities/navigation/performanceBasedCode
RNVArrival_925a	flight/aircraftDescription/accuracy/cmsFieldType flight/aircraftDescription/accuracy/cmsFieldType/@type flight/aircraftDescription/accuracy/cmsFieldType/@phase flight/aircraftDescription/accuracy/cmsFieldType/@uom
RNVEnroute_925b	flight/aircraftDescription/accuracy/cmsFieldType flight/aircraftDescription/accuracy/cmsFieldType/@type flight/aircraftDescription/accuracy/cmsFieldType/@phase flight/aircraftDescription/accuracy/cmsFieldType/@uom
RNVOceanic_925c	flight/aircraftDescription/accuracy/cmsFieldType flight/aircraftDescription/accuracy/cmsFieldType/@type flight/aircraftDescription/accuracy/cmsFieldType/@phase flight/aircraftDescription/accuracy/cmsFieldType/@uom
RNVDeparture_925d	flight/aircraftDescription/accuracy/cmsFieldType flight/aircraftDescription/accuracy/cmsFieldType/@type flight/aircraftDescription/accuracy/cmsFieldType/@phase flight/aircraftDescription/accuracy/cmsFieldType/@uom

Simple Schema	FIXM 3.0 with U.S. Extension (Extension use marked in blue)
RNVSpare1_925e	flight/aircraftDescription/accuracy/cmsFieldType flight/aircraftDescription/accuracy/cmsFieldType/@type flight/aircraftDescription/accuracy/cmsFieldType/@phase flight/aircraftDescription/accuracy/cmsFieldType/@uom
RNVSpare2_925f	flight/aircraftDescription/accuracy/cmsFieldType flight/aircraftDescription/accuracy/cmsFieldType/@type flight/aircraftDescription/accuracy/cmsFieldType/@phase flight/aircraftDescription/accuracy/cmsFieldType/@uom
RNPArrival_925g	flight/aircraftDescription/accuracy/cmsFieldType flight/aircraftDescription/accuracy/cmsFieldType/@type flight/aircraftDescription/accuracy/cmsFieldType/@phase flight/aircraftDescription/accuracy/cmsFieldType/@uom
RNPEnroute_925h	flight/aircraftDescription/accuracy/cmsFieldType flight/aircraftDescription/accuracy/cmsFieldType/@type flight/aircraftDescription/accuracy/cmsFieldType/@phase flight/aircraftDescription/accuracy/cmsFieldType/@uom
RNPOceanic_925i	flight/aircraftDescription/accuracy/cmsFieldType flight/aircraftDescription/accuracy/cmsFieldType/@type flight/aircraftDescription/accuracy/cmsFieldType/@phase flight/aircraftDescription/accuracy/cmsFieldType/@uom
RNPDeparture_925j	flight/aircraftDescription/accuracy/cmsFieldType flight/aircraftDescription/accuracy/cmsFieldType/@type flight/aircraftDescription/accuracy/cmsFieldType/@phase flight/aircraftDescription/accuracy/cmsFieldType/@uom
RNPSpare1_925k	flight/aircraftDescription/accuracy/cmsFieldType flight/aircraftDescription/accuracy/cmsFieldType/@type flight/aircraftDescription/accuracy/cmsFieldType/@phase flight/aircraftDescription/accuracy/cmsFieldType/@uom
RNPSpare2_925l	flight/aircraftDescription/accuracy/cmsFieldType flight/aircraftDescription/accuracy/cmsFieldType/@type flight/aircraftDescription/accuracy/cmsFieldType/@phase flight/aircraftDescription/accuracy/cmsFieldType/@uom
ICAO1stAdaptedField18_999a	flight/supplementalData/additionalFlightInformation/nameValue/@name flight/supplementalData/additionalFlightInformation/nameValue/@value

Simple Schema	FIXM 3.0 with U.S. Extension (Extension use marked in blue)
ICAO2ndAdaptedField18_999b	flight/supplementalData/additionalFlightInformation/nameValue/@name flight/supplementalData/additionalFlightInformation/nameValue/@value
ICAO3rdAdaptedField18_999c	flight/supplementalData/additionalFlightInformation/nameValue/@name flight/supplementalData/additionalFlightInformation/nameValue/@value
ICAO4thAdaptedField18_999d	flight/supplementalData/additionalFlightInformation/nameValue/@name flight/supplementalData/additionalFlightInformation/nameValue/@value
ICAO5thAdaptedField18_999e	flight/supplementalData/additionalFlightInformation/nameValue/@name flight/supplementalData/additionalFlightInformation/nameValue/@value
ICAO6thAdaptedField18_999f	flight/supplementalData/additionalFlightInformation/nameValue/@name flight/supplementalData/additionalFlightInformation/nameValue/@value
ICAO7thAdaptedField18_999g	flight/supplementalData/additionalFlightInformation/nameValue/@name flight/supplementalData/additionalFlightInformation/nameValue/@value
ICAO8thAdaptedField18_999h	flight/supplementalData/additionalFlightInformation/nameValue/@name flight/supplementalData/additionalFlightInformation/nameValue/@value
ICAO9thAdaptedField18_999i	flight/supplementalData/additionalFlightInformation/nameValue/@name flight/supplementalData/additionalFlightInformation/nameValue/@value
ICAO10thAdaptedField18_999j	flight/supplementalData/additionalFlightInformation/nameValue/@name flight/supplementalData/additionalFlightInformation/nameValue/@value
ICAO11thAdaptedField18_999k	flight/supplementalData/additionalFlightInformation/nameValue/@name flight/supplementalData/additionalFlightInformation/nameValue/@value
ICAO12thAdaptedField18_999l	flight/supplementalData/additionalFlightInformation/nameValue/@name flight/supplementalData/additionalFlightInformation/nameValue/@value
ICAO13thAdaptedField18_999m	flight/supplementalData/additionalFlightInformation/nameValue/@name flight/supplementalData/additionalFlightInformation/nameValue/@value
ICAO14thAdaptedField18_999n	flight/supplementalData/additionalFlightInformation/nameValue/@name flight/supplementalData/additionalFlightInformation/nameValue/@value
ICAO15thAdaptedField18_999o	flight/supplementalData/additionalFlightInformation/nameValue/@name flight/supplementalData/additionalFlightInformation/nameValue/@value
ICAO16thAdaptedField18_999p	flight/supplementalData/additionalFlightInformation/nameValue/@name flight/supplementalData/additionalFlightInformation/nameValue/@value
ICAO17thAdaptedField18_999q	flight/supplementalData/additionalFlightInformation/nameValue/@name flight/supplementalData/additionalFlightInformation/nameValue/@value
ICAO18thAdaptedField18_999r	flight/supplementalData/additionalFlightInformation/nameValue/@name flight/supplementalData/additionalFlightInformation/nameValue/@value
ICAO19thAdaptedField18_999s	flight/supplementalData/additionalFlightInformation/nameValue/@name flight/supplementalData/additionalFlightInformation/nameValue/@value
ICAO20thAdaptedField18_999t	flight/supplementalData/additionalFlightInformation/nameValue/@name flight/supplementalData/additionalFlightInformation/nameValue/@value
ICAO21stAdaptedField18_999u	flight/supplementalData/additionalFlightInformation/nameValue/@name flight/supplementalData/additionalFlightInformation/nameValue/@value

Simple Schema	FIXM 3.0 with U.S. Extension (Extension use marked in blue)
ICAO22ndAdaptedField18_999v	flight/supplementalData/additionalFlightInformation/nameValue/@name flight/supplementalData/additionalFlightInformation/nameValue/@value
ICAO23rdAdaptedField18_999w	flight/supplementalData/additionalFlightInformation/nameValue/@name flight/supplementalData/additionalFlightInformation/nameValue/@value
ICAO24thAdaptedField18_999x	flight/supplementalData/additionalFlightInformation/nameValue/@name flight/supplementalData/additionalFlightInformation/nameValue/@value
ICAO25thAdaptedField18_999y	flight/supplementalData/additionalFlightInformation/nameValue/@name flight/supplementalData/additionalFlightInformation/nameValue/@value
localIntendedRoute_10b	flight/agreed/route/@localIntendedRoute
ATCIntendedRoute_10c	flight/agreed/route/@atcIntendedRoute

Converted Route Information [HX]

Simple Schema	FIXM 3.0 with U.S. Extension (Extension use marked in blue)
sourceId_00e	Not Used
sourceTime_00e1	Not Used
sourceSeqNo_00e2	Not Used
flightId_02a	flight/flightIdentification/@aircraftIdentification flight/supplementalData/additionalFlightInformation/nameValue/@name flight/supplementalData/additionalFlightInformation/nameValue/@value
computerId_02d	flight/flightIdentification/@computerId
sspld_167a	flight/flightIdentification/@siteSpecificPlanId
fixTime_68c	Not Used
fix_68c1	flight/agreed/route/expandedRoute/routePoint/point
crossingTime_68c2	flight/agreed/route/expandedRoute/routePoint/@estimatedTime

Cancellation Information [CL]

Simple Schema	FIXM 3.0 with U.S. Extension (Extension use marked in blue)
sourceId_00e	Not Used
sourceTime_00e1	Not Used
sourceSeqNo_00e2	Not Used
flightId_02a	flight/flightIdentification/@aircraftIdentification flight/supplementalData/additionalFlightInformation/nameValue/@name flight/supplementalData/additionalFlightInformation/nameValue/@value
computerId_02d	flight/flightIdentification/@computerId
sspld_167a	flight/flightIdentification/@siteSpecificPlanId

Simple Schema	FIXM 3.0 with U.S. Extension (Extension use marked in blue)
departurePoint_26a	flight/departure/@departurePoint
destination_27a	flight/arrival/@arrivalPoint

Departure Information [DH]

Simple Schema	FIXM 3.0 with U.S. Extension (Extension use marked in blue)
sourceId_00e	Not Used
sourceTime_00e1	Not Used
sourceSeqNo_00e2	Not Used
flightId_02a	flight/flightIdentification/@aircraftIdentification flight/supplementalData/additionalFlightInformation/nameValue/@name flight/supplementalData/additionalFlightInformation/nameValue/@value
computerId_02d	flight/flightIdentification/@computerId
sspld_167a	flight/flightIdentification/@siteSpecificPlanId
numberOfAircraft_03a	flight/aircraftDescription/@aircraftQuantity flight/aircraftDescription/@tfmsSpecialAircraftQualifier
typeOfAircraft_03c	flight/aircraftDescription/aircraftType/icaoModelIdentifier
airborneEquip_03e	flight/aircraftDescription/aircraftType/@equipmentQualifier
departurePoint_26a	flight/departure/@departurePoint
coordStatusTime_07d	Not Used
coordStatus_07d1	flight/coordination/@coordinationTimeHandling
coordTime_07d2	flight/coordination/@coordinationTime
destination_27a	flight/arrival/@arrivalPoint
ETA_28a	flight/arrival/runwayPositionAndTime/runwayTime/estimated/@time

Aircraft Identification Amendment Information [IH]

Simple Schema	FIXM 3.0 with U.S. Extension (Extension use marked in blue)
sourceId_00e	Not Used
sourceTime_00e1	Not Used
sourceSeqNo_00e2	Not Used
flightId_02a	flight/flightIdentificationPrevious/@aircraftIdentification
computerId_02d	flight/flightIdentificationPrevious/@computerId
sspld_167a	flight/flightIdentificationPrevious/@siteSpecificPlanId

newFlightId_02aN	flight/flightIdentification/@aircraftIdentification flight/supplementalData/additionalFlightInformation/nameValue/@name flight/supplementalData/additionalFlightInformation/nameValue/@value
newComputerId_02dN	flight/flightIdentification/@computerId
newSspld_167aN	flight/flightIdentification/@siteSpecificPlanId
departurePoint_26a	flight/departure/@departurePoint
destination_27a	flight/arrival/@arrivalPoint

Hold Information [HH]

Simple Schema	FIXM 3.0 with U.S. Extension (Extension use marked in blue)
sourceId_00e	Not Used
sourceTime_00e1	Not Used
sourceSeqNo_00e2	Not Used
flightId_02a	flight/flightIdentification/@aircraftIdentification flight/supplementalData/additionalFlightInformation/nameValue/@name flight/supplementalData/additionalFlightInformation/nameValue/@value
computerId_02d	flight/flightIdentification/@computerId
sspld_167a	flight/flightIdentification/@siteSpecificPlanId
holdDataFix_21a	flight/agreed/route/holdFix flight/status/@airborneHold
holdDataTime_21d	flight/enRoute/expectedFurtherClearanceTime/@time
holdDataAction_21e	flight/status/@airborneHold

Progress Report Information [PH]

Simple Schema	FIXM 3.0 with U.S. Extension (Extension use marked in blue)
sourceId_00e	Not Used
sourceTime_00e1	Not Used
sourceSeqNo_00e2	Not Used
flightId_02a	flight/flightIdentification/@aircraftIdentification flight/supplementalData/additionalFlightInformation/nameValue/@name flight/supplementalData/additionalFlightInformation/nameValue/@value
computerId_02d	flight/flightIdentification/@computerId
sspld_167a	flight/flightIdentification/@siteSpecificPlanId
progressReportFix_18a	flight/enRoute/position/position flight/enRoute/postion/@reportSource

Simple Schema	FIXM 3.0 with U.S. Extension (Extension use marked in blue)
progressReportTime_18d	flight/enRoute/position/@positionTime

Flight Arrival Information [HV]

Simple Schema	FIXM 3.0 with U.S. Extension (Extension use marked in blue)
sourceId_00e	Not Used
sourceTime_00e1	Not Used
sourceSeqNo_00e2	Not Used
flightId_02a	flight/flightIdentification/@aircraftIdentification flight/supplementalData/additionalFlightInformation/nameValue/@name flight/supplementalData/additionalFlightInformation/nameValue/@value
computerId_02d	flight/flightIdentification/@computerId
sspld_167a	flight/flightIdentification/@siteSpecificPlanId
departurePoint_26a	flight/departure/@departurePoint
destination_27a	flight/arrival/@arrivalPoint
arrivalTime_28b	flight/arrival/runwayPositionAndTime/runwayTime/actual/@time

Expected Departure Time Information [ET]

Simple Schema	FIXM 3.0 with U.S. Extension (Extension use marked in blue)
sourceId_00e	Not Used
sourceTime_00e1	Not Used
sourceSeqNo_00e2	Not Used
flightId_02a	flight/flightIdentification/@aircraftIdentification flight/supplementalData/additionalFlightInformation/nameValue/@name flight/supplementalData/additionalFlightInformation/nameValue/@value
computerId_02d	flight/flightIdentification/@computerId
sspld_167a	flight/flightIdentification/@siteSpecificPlanId
EDCT_92a	flight/departure/runwayPositionAndTime/runwayTime/controlled/@time
cancellationIndicator_92b	flight/departure/runwayPositionAndTime/runwayTime/controlled

Position Update Information [HP]

Simple Schema	FIXM 3.0 with U.S. Extension (Extension use marked in blue)
sourceId_00e	Not Used
sourceTime_00e1	Not Used

Simple Schema	FIXM 3.0 with U.S. Extension (Extension use marked in blue)
sourceSeqNo_00e2	Not Used
flightId_02a	flight/flightIdentification/@aircraftIdentification flight/supplementalData/additionalFlightInformation/nameValue/@name flight/supplementalData/additionalFlightInformation/nameValue/@value
computerId_02d	flight/flightIdentification/@computerId
sspld_167a	flight/flightIdentification/@siteSpecificPlanId
coordFix_06a	flight/coordination/coordinationFix
coordStatusTime_07d	Not Used
coordStatus_07d1	flight/coordination/@coordinationTimeHandling
coordTime_07d2	flight/coordination/@coordinationTime
delayTime_07e	flight/coordination/@delayTimeToAbsorb

Tentative Flight Plan Information [NP]

Simple Schema	FIXM 3.0 with U.S. Extension (Extension use marked in blue)
sourceId_00e	Not Used
sourceTime_00e1	Not Used
sourceSeqNo_00e2	Not Used
flightId_02a	flight/flightIdentification/@aircraftIdentification flight/supplementalData/additionalFlightInformation/nameValue/@name flight/supplementalData/additionalFlightInformation/nameValue/@value
computerId_02d	flight/flightIdentification/@computerId
eramGufi_316a	Not Used
eramGufi_316aNum	Not Used
eramGufi_316aDT	Not Used
sspld_167a	flight/flightIdentification/@siteSpecificPlanId
numberOfAircraft_03a	flight/aircraftDescription/@aircraftQuantity flight/aircraftDescription/@tfmsSpecialAircraftQualifier
typeOfAircraft_03c	flight/aircraftDescription/aircraftType/icaoModelIdentifier
airborneEquip_03e	flight/aircraftDescription/aircraftType/@equipmentQualifier
beaconCode_04a	flight/enRoute/beaconCodeAssignment/currentBeaconCode
trueAirSpeed_05a	flight/requestedAirspeed/nasAirspeed flight/requestedAirspeed/@uom

Simple Schema	FIXM 3.0 with U.S. Extension (Extension use marked in blue)
machSpeed_05c	flight/requestedAirspeed/nasAirspeed flight/requestedAirspeed/@uom
classifiedSpeed_05d	flight/requestedAirspeed/classified
assignedAlt_08a	flight/assignedAltitude/simple flight/assignedAltitude/simple/@uom
assignedAlt_08b	flight/assignedAltitude/vfrOnTop
assignedAlt_08c	flight/assignedAltitude/vfrOnTopPlus flight/assignedAltitude/vfrOnTopPlus/@uom
assignedAlt_08d	flight/assignedAltitude/block/above flight/assignedAltitude/block/above/@uom flight/assignedAltitude/block/below flight/assignedAltitude/block/below/@uom
assignedAlt_08e	flight/assignedAltitude/above flight/assignedAltitude/above/@uom
assignedAlt_08f	flight/assignedAltitude/altFixAlt/point flight/assignedAltitude/altFixAlt/post flight/assignedAltitude/altFixAlt/post/@uom flight/assignedAltitude/altFixAlt/pre flight/assignedAltitude/altFixAlt/pre/@uom
assignedAlt_08g	flight/assignedAltitude/vfr
assignedAlt_08h	flight/assignedAltitude/vfrPlus flight/assignedAltitude/vfrPlus/@uom
reportedAlt_54a	flight/enRoute/position/altitude flight/enRoute/position/altitude/@uom
reportedAlt_54b	Not Used
reportedAlt_54c	Not Used
interimAlt_76b	flight/interimAltitude flight/interimAltitude/@uom

Tentative Aircraft Identification Amendment Information [NI]

Simple Schema	FIXM 3.0 with U.S. Extension (Extension use marked in blue)
sourceId_00e	Not Used
sourceTime_00e1	Not Used
sourceSeqNo_00e2	Not Used
flightId_02a	flight/flightIdentificationPrevious/@aircraftIdentification
computerId_02d	flight/flightIdentificationPrevious/@computerId

Simple Schema	FIXM 3.0 with U.S. Extension (Extension use marked in blue)
sspld_167a	flight/flightIdentificationPrevious/@siteSpecificPlanId
newFlightId_02aN	flight/flightIdentification/@aircraftIdentification flight/supplementalData/additionalFlightInformation/nameValue/@name flight/supplementalData/additionalFlightInformation/nameValue/@value
newComputerId_02dN	flight/flightIdentification/@computerId
newSspld_167aN	flight/flightIdentification/@siteSpecificPlanId

Tentative Flight Plan Removal [NL]

Simple Schema	FIXM 3.0 with U.S. Extension (Extension use marked in blue)
sourceId_00e	Not Used
sourceTime_00e1	Not Used
sourceSeqNo_00e2	Not Used
flightId_02a	flight/flightIdentification/@aircraftIdentification flight/supplementalData/additionalFlightInformation/nameValue/@name flight/supplementalData/additionalFlightInformation/nameValue/@value
computerId_02d	flight/flightIdentification/@computerId or flight/flightIdentificationPrevious/@computerId
sspld_167a	flight/flightIdentification/@siteSpecificPlanId or flight/flightIdentificationPrevious/@siteSpecificPlanId
mergedFPStatus_339a	Not Used
mergedFPComputerId_341a	flight/flightIdentification/@computerId
mergedFPSspld_342a	flight/flightIdentification/@siteSpecificPlanId

Tentative Flight Plan Amendment Information [NU]

Simple Schema	FIXM 3.0 with U.S. Extension (Extension use marked in blue)
sourceId_00e	Not Used
sourceTime_00e1	Not Used
sourceSeqNo_00e2	Not Used
flightId_02a	flight/flightIdentification/@aircraftIdentification flight/supplementalData/additionalFlightInformation/nameValue/@name flight/supplementalData/additionalFlightInformation/nameValue/@value
computerId_02d	flight/flightIdentification/@computerId
sspld_167a	flight/flightIdentification/@siteSpecificPlanId

Simple Schema	FIXM 3.0 with U.S. Extension (Extension use marked in blue)
numberOfAircraft_03a	flight/aircraftDescription/@aircraftQuantity flight/aircraftDescription/@tfmsSpecialAircraftQualifier
typeOfAircraft_03c	flight/aircraftDescription/aircraftType/icaoModelIdentifier
airborneEquip_03e	flight/aircraftDescription/aircraftType/@equipmentQualifier
beaconCode_04a	flight/enRoute/beaconCodeAssignment/currentBeaconCode
trueAirSpeed_05a	flight/requestedAirspeed/nasAirspeed flight/requestedAirspeed/@uom
machSpeed_05c	flight/requestedAirspeed/nasAirspeed flight/requestedAirspeed/@uom
classifiedSpeed_05d	flight/requestedAirspeed/classified
assignedAlt_08a	flight/assignedAltitude/simple flight/assignedAltitude/simple/@uom
assignedAlt_08b	flight/assignedAltitude/vfrOnTop
assignedAlt_08c	flight/assignedAltitude/vfrOnTopPlus flight/assignedAltitude/vfrOnTopPlus/@uom
assignedAlt_08d	flight/assignedAltitude/block/above flight/assignedAltitude/block/above/@uom flight/assignedAltitude/block/below flight/assignedAltitude/block/below/@uom
assignedAlt_08e	flight/assignedAltitude/above flight/assignedAltitude/above/@uom
assignedAlt_08f	flight/assignedAltitude/altFixAlt/point flight/assignedAltitude/altFixAlt/post flight/assignedAltitude/altFixAlt/post/@uom flight/assignedAltitude/altFixAlt/pre flight/assignedAltitude/altFixAlt/pre/@uom
assignedAlt_08g	flight/assignedAltitude/vfr
assignedAlt_08h	flight/assignedAltitude/vfrPlus flight/assignedAltitude/vfrPlus/@uom
reportedAlt_54a	flight/enRoute/position/altitude flight/enRoute/position/altitude/@uom
reportedAlt_54b	Not Used
reportedAlt_54c	Not Used
interimAlt_76b	flight/interimAltitude flight/interimAltitude/@uom

Track Information [TH]

Simple Schema	FIXM 3.0 with U.S. Extension (Extension use marked in blue)
sourceId_00e	Not Used
sourceTime_00e1	Not Used
sourceSeqNo_00e2	Not Used
flightId_02a	flight/flightIdentification/@aircraftIdentification flight/supplementalData/additionalFlightInformation/nameValue/@name flight/supplementalData/additionalFlightInformation/nameValue/@value
computerId_02d	flight/flightIdentification/@computerId
sspld_167a	flight/flightIdentification/@siteSpecificPlanId
groundSpeed_05b	flight/enRoute/position/actualSpeed/surveillance flight/enRoute/position/actualSpeed/surveillance/@uom flight/enRoute/position/@reportSource
assignedAlt_08a	flight/assignedAltitude/simple flight/assignedAltitude/simple/@uom
assignedAlt_08b	flight/assignedAltitude/vfrOnTop
assignedAlt_08c	flight/assignedAltitude/vfrOnTopPlus flight/assignedAltitude/vfrOnTopPlus/@uom
assignedAlt_08d	flight/assignedAltitude/block/above flight/assignedAltitude/block/above/@uom flight/assignedAltitude/block/below flight/assignedAltitude/block/below/@uom
assignedAlt_08e	flight/assignedAltitude/above flight/assignedAltitude/above/@uom
assignedAlt_08f	flight/assignedAltitude/altFixAlt/point flight/assignedAltitude/altFixAlt/post flight/assignedAltitude/altFixAlt/post/@uom flight/assignedAltitude/altFixAlt/pre flight/assignedAltitude/altFixAlt/pre/@uom
assignedAlt_08g	flight/assignedAltitude/vfr
assignedAlt_08h	flight/assignedAltitude/vfrPlus flight/assignedAltitude/vfrPlus/@uom
reportedAlt_54a	flight/enRoute/position/altitude flight/enRoute/position/altitude/@uom
reportedAlt_54b	Not Used
reportedAlt_54c	Not Used
controllingFacility_138a	flight/controllingUnit/@unitIdentifier
controllingSector_138b	flight/controllingUnit/@sectorIdentifier
receivingFacility_139a	flight/enRoute/boundaryCrossings/handoff/receivingUnit/@unitIdentifier

Simple Schema	FIXM 3.0 with U.S. Extension (Extension use marked in blue)
receivingSector_139b	flight/enRoute/boundaryCrossings/handoff/receivingUnit/@sectorIdentifier
trackPosition_23d	flight/enRoute/position/position/location/pos flight/enRoute/position/position/location/@srsName
trackVelocity_23e	flight/enRoute/position/trackVelocity/x flight/enRoute/position/trackVelocity/x/@uom flight/enRoute/position/trackVelocity/y flight/enRoute/position/trackVelocity/y/@uom flight/enRoute/position/actualSpeed/surveillance flight/enRoute/position/actualSpeed/surveillance/@uom flight/enRoute/position/heading flight/enRoute/position/heading/@uom
coastIndicator_153a	flight/enRoute/position/@coastIndicator
timeOfTrackData_170a	flight/enRoute/position/@positionTime
targetPosition_171a	flight/enRoute/position/targetPosition/pos flight/enRoute/position/targetPosition/@srsName
targetAlt_172a	flight/enRoute/position/targetAltitude flight/enRoute/position/targetAltitude/@uom
targetAltInvalid_172b	flight/enRoute/position/targetAltitude/@invalid
timeOfTargetData_173a	flight/enRoute/position/@targetPositionTime

Drop Track Information [RH]

Simple Schema	FIXM 3.0 with U.S. Extension (Extension use marked in blue)
sourceId_00e	Not Used
sourceTime_00e1	Not Used
sourceSeqNo_00e2	Not Used
flightId_02a	flight/flightIdentification/@aircraftIdentification flight/supplementalData/additionalFlightInformation/nameValue/@name flight/supplementalData/additionalFlightInformation/nameValue/@value
computerId_02d	flight/flightIdentification/@computerId
sspld_167a	flight/flightIdentification/@siteSpecificPlanId

Interim Altitude Information [LH]

Simple Schema	FIXM 3.0 with U.S. Extension (Extension use marked in blue)
sourceId_00e	Not Used
sourceTime_00e1	Not Used
sourceSeqNo_00e2	Not Used

Simple Schema	FIXM 3.0 with U.S. Extension (Extension use marked in blue)
interimAlt_76a	flight/interimAltitude flight/interimAltitude/@uom
interimAlt_76b	flight/interimAltitude flight/interimAltitude/@uom
flightId_02a	flight/flightIdentification/@aircraftIdentification flight/supplementalData/additionalFlightInformation/nameValue/@name flight/supplementalData/additionalFlightInformation/nameValue/@value
computerId_02d	flight/flightIdentification/@computerId
sspld_167a	flight/flightIdentification/@siteSpecificPlanId

ARTS Flow Control Track/Full Data Block Information [HZ]

Simple Schema	FIXM 3.0 with U.S. Extension (Extension use marked in blue)
sourceId_00e	Not Used
sourceTime_00e1	Not Used
sourceSeqNo_00e2	Not Used
addresseeARTS_00d	Not Used
addresserARTS_00a	Not Used
flightId_02a	flight/flightIdentification/@aircraftIdentification flight/supplementalData/additionalFlightInformation/nameValue/@name flight/supplementalData/additionalFlightInformation/nameValue/@value
computerId_02d	flight/flightIdentification/@computerId
groundSpeed_05b	flight/enRoute/position/actualSpeed/surveillance flight/enRoute/position/actualSpeed/surveillance/@uom
assignedAlt_08a	flight/assignedAltitude/simple flight/assignedAltitude/simple/@uom
assignedAlt_08c	flight/assignedAltitude/vfrOnTopPlus flight/assignedAltitude/vfrOnTopPlus/@uom
interimAlt_76bT	flight/interimAltitude flight/interimAltitude/@uom
assignedAlt_08d	flight/assignedAltitude/block/above flight/assignedAltitude/block/above/@uom flight/assignedAltitude/block/below flight/assignedAltitude/block/below/@uom
reportedAlt_54aC	flight/enRoute/position/altitude flight/enRoute/position/altitude/@uom

Simple Schema	FIXM 3.0 with U.S. Extension (Extension use marked in blue)
trackPosition_23d	flight/enRoute/position/position/location/pos flight/enRoute/position/position/location/@srsName

Beacon Code Reassignment [BA]

Simple Schema	FIXM 3.0 with U.S. Extension (Extension use marked in blue)
sourceId_00e	Not Used
sourceTime_00e1	Not Used
sourceSeqNo_00e2	Not Used
flightId_02a	flight/flightIdentification/@aircraftIdentification flight/supplementalData/additionalFlightInformation/nameValue/@name flight/supplementalData/additionalFlightInformation/nameValue/@value
computerId_02d	flight/flightIdentification/@computerId
eramGufi_316a	Not Used
eramGufi_316aNum	Not Used
eramGufi_316aDT	Not Used
sspld_167a	flight/flightIdentification/@siteSpecificPlanId
beaconCode_04a	flight/enRoute/beaconCodeAssignment/currentBeaconCode
departurePoint_26a	flight/departure/@departurePoint
destination_27a	flight/arrival/@arrivalPoint

Beacon Code Restricted [RE]

Simple Schema	FIXM 3.0 with U.S. Extension (Extension use marked in blue)
sourceId_00e	Not Used
sourceTime_00e1	Not Used
sourceSeqNo_00e2	Not Used
flightId_02a	flight/flightIdentification/@aircraftIdentification flight/supplementalData/additionalFlightInformation/nameValue/@name flight/supplementalData/additionalFlightInformation/nameValue/@value
computerId_02d	flight/flightIdentification/@computerId
eramGufi_316a	Not Used

Simple Schema	FIXM 3.0 with U.S. Extension (Extension use marked in blue)
eramGufi_316aNum	Not Used
eramGufi_316aDT	Not Used
sspld_167a	flight/flightIdentification/@siteSpecificPlanId
beaconCode_04a	flight/enRoute/beaconCodeAssignment/currentBeaconCode
departurePoint_26a	flight/departure/@departurePoint
destination_27a	flight/arrival/@arrivalPoint
restrictedBeaconCode_04aR	flight/enRoute/beaconCodeAssignment/previousBeaconCode

FDB Fourth Line Information [HF]

Simple Schema	FIXM 3.0 with U.S. Extension (Extension use marked in blue)
sourceId_00e	Not Used
sourceTime_00e1	Not Used
sourceSeqNo_00e2	Not Used
flightId_02a	flight/flightIdentification/@aircraftIdentification flight/supplementalData/additionalFlightInformation/nameValue/@name flight/supplementalData/additionalFlightInformation/nameValue/@value
computerId_02d	flight/flightIdentification/@computerId
sspld_167a	flight/flightIdentification/@siteSpecificPlanId
FDB4thLineHeading_155a	flight/enRoute/cleared/@clearanceHeading
FDB4thLineSpeed_155b	flight/enRoute/cleared/@clearanceSpeed
FDB4thLineText_155c	flight/enRoute/cleared/@clearanceText

Point Out Information [HT]

Simple Schema	FIXM 3.0 with U.S. Extension (Extension use marked in blue)
sourceId_00e	Not Used
sourceTime_00e1	Not Used
sourceSeqNo_00e2	Not Used
flightId_02a	flight/flightIdentification/@aircraftIdentification flight/supplementalData/additionalFlightInformation/nameValue/@name flight/supplementalData/additionalFlightInformation/nameValue/@value
computerId_02d	flight/flightIdentification/@computerId
sspld_167a	flight/flightIdentification/@siteSpecificPlanId

Simple Schema	FIXM 3.0 with U.S. Extension (Extension use marked in blue)
sourceSectorRouting_134b	flight/enRoute/pointout/originatingUnit/@unitIdentifier flight/enRoute/pointout/originatingUnit/@sectorIdentifier
targetSector_16g	flight/enRoute/pointout/receivingUnit/@unitIdentifier flight/enRoute/pointout/receivingUnit/@sectorIdentifier

Inbound Point Out Information [PT]

Simple Schema	FIXM 3.0 with U.S. Extension (Extension use marked in blue)
sourceId_00e	Not Used
sourceTime_00e1	Not Used
sourceSeqNo_00e2	Not Used
flightId_02a	flight/flightIdentification/@aircraftIdentification flight/supplementalData/additionalFlightInformation/nameValue/@name flight/supplementalData/additionalFlightInformation/nameValue/@value
computerId_02d	flight/flightIdentification/@computerId
sspld_167a	flight/flightIdentification/@siteSpecificPlanId
controllingFacility_138a	flight/enRoute/pointout/originatingUnit/@unitIdentifier
controllingSector_138b	flight/enRoute/pointout/originatingUnit/@sectorIdentifier
receivingFacility_139a	flight/enRoute/pointout/receivingUnit/@unitIdentifier
receivingSector_139b	flight/enRoute/pointout/receivingUnit/@sectorIdentifier

Handoff Status [OH]

Simple Schema	FIXM 3.0 with U.S. Extension (Extension use marked in blue)
sourceId_00e	Not Used
sourceTime_00e1	Not Used
sourceSeqNo_00e2	Not Used
flightId_02a	flight/flightIdentification/@aircraftIdentification flight/supplementalData/additionalFlightInformation/nameValue/@name flight/supplementalData/additionalFlightInformation/nameValue/@value
computerId_02d	flight/flightIdentification/@computerId
sspld_167a	flight/flightIdentification/@siteSpecificPlanId
controllingFacility_138a	flight/enRoute/boundaryCrossings/handoff/transferringUnit/@unitIdentifier
controllingSector_138b	flight/enRoute/boundaryCrossings/handoff/transferringUnit/@sectorIdentifier
receivingFacility_139a	flight/enRoute/boundaryCrossings/handoff/receivingUnit/@unitIdentifier
receivingSector_139b	flight/enRoute/boundaryCrossings/handoff/receivingUnit/@sectorIdentifier
acceptingFacility_334a	flight/enRoute/boundaryCrossings/handoff/acceptingUnit/@unitIdentifier
acceptingSector_335a	flight/enRoute/boundaryCrossings/handoff/acceptingUnit/@sectorIdentifier

Simple Schema	FIXM 3.0 with U.S. Extension (Extension use marked in blue)
handoffEventIndicator_336a	flight/enRoute/boundaryCrossings/handoff/@event

RReply

Simple Schema	FIXM 3.0 with U.S. Extension (Extension use marked in blue)
flightPlan	<i>See Flight Plan tab</i>
groundSpeed_05b	flight/enRoute/position/actualSpeed/surveillance flight/enRoute/position/actualSpeed/surveillance/@uom
reportedAlt_54a	flight/enRoute/position/altitude flight/enRoute/position/altitude/@uom
reportedAlt_54b	Not Used
reportedAlt_54c	Not Used
controllingFacility_138a	flight/controllingUnit/@unitIdentifier
controllingSector_138b	flight/controllingUnit/@sectorIdentifier
receivingFacility_139a	flight/enRoute/boundaryCrossings/handoff/receivingUnit/@unitIdentifier
receivingSector_139b	flight/enRoute/boundaryCrossings/handoff/receivingUnit/@sectorIdentifier
trackPosition_23d	flight/enRoute/position/position/location/pos flight/enRoute/position/position/location/@srsName
trackVelocity_23e	flight/enRoute/position/trackVelocity/x flight/enRoute/position/trackVelocity/x/@uom flight/enRoute/position/trackVelocity/y flight/enRoute/position/trackVelocity/y/@uom flight/enRoute/position/actualSpeed/surveillance flight/enRoute/position/actualSpeed/surveillance/@uom flight/enRoute/position/heading flight/enRoute/position/heading/@uom
coastIndicator_153a	flight/enRoute/position/@coastIndicator
timeOfTrackData_170a	flight/enRoute/position/@positionTime
targetPosition_171a	flight/enRoute/position/targetPosition/pos flight/enRoute/position/targetPosition/@srsName
targetAlt_172a	flight/enRoute/position/targetAltitude flight/enRoute/position/targetAltitude/@uom
targetAltInvalid_172b	flight/enRoute/position/targetAltitude/@invalid
timeOfTargetData_173a	flight/enRoute/position/@targetPositionTime

Reconstitution Flight Message – DBRTFPI

Simple Schema	FIXM 3.0 with U.S. Extension (Extension use marked in blue)
computerId_02d	flight/flightIdentification/@computerId
flightId_02a	flight/flightIdentification/@aircraftIdentification flight/supplementalData/additionalFlightInformation/nameValue/@name flight/supplementalData/additionalFlightInformation/nameValue/@value
eramGufi_316a	Not Used
eramGufi_316aNum	Not Used
eramGufi_316aDT	Not Used
sspld_167a	flight/flightIdentification/@siteSpecificPlanId
numberOfAircraft_03a	flight/aircraftDescription/@aircraftQuantity flight/aircraftDescription/@tfmsSpecialAircraftQualifier
typeOfAircraft_03c	flight/aircraftDescription/aircraftType/icaoModelIdentifier
airborneEquip_03e	flight/aircraftDescription/aircraftType/@equipmentQualifier
beaconCode_04a	flight/enRoute/beaconCodeAssignment/currentBeaconCode
trueAirSpeed_05a	flight/requestedAirspeed/nasAirspeed flight/requestedAirspeed/@uom
machSpeed_05c	flight/requestedAirspeed/nasAirspeed flight/requestedAirspeed/@uom
classifiedSpeed_05d	flight/requestedAirspeed/classified
coordFix_06a	flight/coordination/coordinationFix
coordStatusTime_07d	Not Used
coordStatus_07d1	flight/coordination/@coordinationTimeHandling
coordTime_07d2	flight/coordination/@coordinationTime
delayTime_07e	flight/coordination/@delayTimeToAbsorb
departureTime_243n	flight/departure/runwayPositionAndTime/runwayTime/actual/@time
proposedDepartureTime_2431	flight/departure/runwayPositionAndTime/runwayTime/estimated/@time
estDepartureClearanceTime_2432	flight/departure/runwayPositionAndTime/runwayTime/controlled/@time
arrivalTime_28b	flight/arrival/runwayPositionAndTime/runwayTime/actual/@time
assignedAlt_08a	flight/assignedAltitude/simple flight/assignedAltitude/simple/@uom
assignedAlt_08b	flight/assignedAltitude/vfrOnTop

Simple Schema	FIXM 3.0 with U.S. Extension (Extension use marked in blue)
assignedAlt_08c	flight/assignedAltitude/vfrOnTopPlus flight/assignedAltitude/vfrOnTopPlus/@uom
assignedAlt_08d	flight/assignedAltitude/block/above flight/assignedAltitude/block/above/@uom flight/assignedAltitude/block/below flight/assignedAltitude/block/below/@uom
assignedAlt_08e	flight/assignedAltitude/above flight/assignedAltitude/above/@uom
assignedAlt_08f	flight/assignedAltitude/altFixAlt/point flight/assignedAltitude/altFixAlt/post flight/assignedAltitude/altFixAlt/post/@uom flight/assignedAltitude/altFixAlt/pre flight/assignedAltitude/altFixAlt/pre/@uom
assignedAlt_08g	flight/assignedAltitude/vfr
assignedAlt_08h	flight/assignedAltitude/vfrPlus flight/assignedAltitude/vfrPlus/@uom
requestedAlt_09a	flight/requestedAltitude/simple flight/requestedAltitude/simple/@uom
requestedAlt_09b	flight/requestedAltitude/vfrOnTop
requestedAlt_09c	flight/requestedAltitude/vfrOnTopPlus flight/requestedAltitude/vfrOnTopPlus/@uom
requestedAlt_09d	flight/requestedAltitude/above flight/requestedAltitude/above/@uom
requestedAlt_09e	flight/requestedAltitude/block/above flight/requestedAltitude/block/above/@uom flight/requestedAltitude/block/below flight/requestedAltitude/block/below/@uom
requestedAlt_09f	flight/requestedAltitude/vfr
requestedAlt_09g	flight/requestedAltitude/vfrPlus flight/requestedAltitude/vfrPlus/@uom
flightPlanRoute_10a	flight/agreed/route/@nasRouteText
departurePoint_26a	flight/departure/@departurePoint
destination_27a	flight/arrival/@arrivalPoint
ETE_2439	flight/agreed/route/@flightDuration
ETA_28a	flight/arrival/runwayPositionAndTime/runwayTime/estimated/@time
remarks_11c	flight/flightPlan/@flightPlanRemarks
holdDataFix_21a	flight/agreed/route/holdFix flight/status/@airborneHold
holdDataTime_21d	flight/enRoute/expectedFurtherClearanceTime/@time
progressReportFix_18a	flight/enRoute/position/position
progressReportTime_18d	flight/enRoute/position/@positionTime

Simple Schema	FIXM 3.0 with U.S. Extension (Extension use marked in blue)
departureAutoRouteInhibitIndicator_244g	Not Used
destinationAutoRouteInhibitIndicator_244h	Not Used
interimAlt_76b	flight/interimAltitude flight/interimAltitude/@uom
AARFId10_142e	flight/agreed/route/nasadaptedArrivalRoute/@nasRouteAlphanumeric
AARNonFId10_142f	flight/agreed/route/nasadaptedArrivalRoute/@nasRouteAlphanumeric
ADRFId10_142c	flight/agreed/route/adaptedDepartureRoute/@nasRouteAlphanumeric
ADRNonFId10_142d	flight/agreed/route/adaptedDepartureRoute/@nasRouteAlphanumeric
ADARFId10_142a	flight/agreed/route/adaptedArrivalDepartureRoute/@nasRouteAlphanumeric
ADARNonFId10_142b	flight/agreed/route/adaptedArrivalDepartureRoute/@nasRouteAlphanumeric
AARId_141c	flight/agreed/route/nasadaptedArrivalRoute/@nasRouteIdentifier
ADRIId_141b	flight/agreed/route/adaptedDepartureRoute/@nasRouteIdentifier
ADARId_141a	flight/agreed/route/adaptedArrivalDepartureRoute/@nasRouteIdentifier
FPA_143a0	Not Used
FPA_143a1	Not Used
FPA_143a2	Not Used
FPA_143a3	Not Used
FAV_143b0	flight/agreed/route/nasadaptedArrivalRoute/nasFavNumber
FAV_143b1	flight/agreed/route/nasadaptedArrivalRoute/nasFavNumber
FAV_143b2	flight/agreed/route/nasadaptedArrivalRoute/nasFavNumber
FAV_143b3	flight/agreed/route/nasadaptedArrivalRoute/nasFavNumber
timeBtw1stAndLastConvertedRouteFix_2449	flight/agreed/route/@flightDuration
flightRules_908a	flight/agree/route/@initialFlightRules
typeOfFlight_908b	flight/@flightType
wakeTurbulenceCat_909c	flight/aircraftDescription/@wakeTurbulence
comNavApproachEquip_910a	Not Used
survEquip_910b	Not Used
altAero_916c	flight/arrival/arrivalAerodromeAlternate/@code or flight/arrival/arrivalAerodromeAlternate/point
FDB4thLineHeading_155a	flight/enRoute/cleared/@clearanceHeading
FDB4thLineSpeed_155b	flight/enRoute/cleared/@clearanceSpeed
FDB4thLineText_155c	flight/enRoute/cleared/@clearanceText
externalBeaconCode_04b	flight/enRoute/beaconCodeAssignment/reassignedBeaconCode
localIntendedRoute_10b	flight/agreed/route/@localIntendedRoute
timeRouteValues_2461	Not Used
fixTimes	Not Used

Simple Schema	FIXM 3.0 with U.S. Extension (Extension use marked in blue)
fixTime_68c	Not Used
fix_68c1	flight/agreed/route/expandedRoute/routePoint/point
crossingTime_68c2	flight/agreed/route/expandedRoute/routePoint/@estimatedTime
adjacentCenterRouting	Not Used
outputRouting_253a	Not Used
FAV_29d	Not Used
ICAOStoredFormat_918a	Not Used
EETIndicator_918b	flight/agreed/route/estimatedElapsedTime/location flight/agreed/route/estimatedElapsedTime/@elapsedTime
RIFIndicator_918c	flight/routeToRevisedDestination/route/@routeText
REGIndicator_918d	flight/aircraftDescription/@registration
SELIndicator_918e	flight/aircraftDescription/capabilities/communication/@selectiveCallingCode
OPRIndicator_918f	flight/operator/operatingOrganization/organization/@name
STSIndicator_918g	flight/specialHandling
TYPIndicator_918h	flight/aircraftDescription/aircraftType/otherModelData
PERIndicator_918i	flight/aircraftDescription/@aircraftPerformance
COMIndicator_918j	flight/aircraftDescription/capabilities/communication/ @otherCommunicationCapabilities
DATIndicator_918k	flight/aircraftDescription/capabilities/communication/ @otherDataLinkCapabilities
NAVIndicator_918l	flight/aircraftDescription/capabilities/navigation/ @otherNavigationCapabilities
DEPIndicator_918m	flight/departure/departureAerodrome/@name flight/departure/departureAerodrome/point
DESTIndicator_918n	flight/arrival/arrivalAerodrome/@name flight/arrival/arrivalAerodrome/point
ALTNIndicator_918o	flight/arrival/arrivalAerodromeAlternate/@name flight/arrival/arrivalAerodromeAlternate/point
RALTIndicator_918p	flight/enRoute/alternateAerodrome

Simple Schema	FIXM 3.0 with U.S. Extension (Extension use marked in blue)
CODEIndicator_918q	flight/aircraftDescription/@aircraftAddress
RACEIndicator_918r	Not Used
SURIndicator_918s	flight/aircraftDescription/capabilities/surveillance/ @otherSurveillanceCapabilities
DLEIndicator_918t	flight/agreed/route/segment/routePoint/point flight/agreed/route/segment/routePoint/@delayAtPoint
TALTIndicator_918u	flight/departure/takeoffAlternateAerodrome
DOFIndicator_918v	Not Used
ORGNIndicator_918w	flight/originator/aftnAddress flight/originator/flightOriginator
PBNIndicator_918x	flight/aircraftDescription/capabilities/navigation/performanceBasedCode
ICAO1stAdaptedField18_999a	flight/supplementalData/additionalFlightInformation/nameValue/@name flight/supplementalData/additionalFlightInformation/nameValue/@value
ICAO2ndAdaptedField18_999b	flight/supplementalData/additionalFlightInformation/nameValue/@name flight/supplementalData/additionalFlightInformation/nameValue/@value
ICAO3rdAdaptedField18_999c	flight/supplementalData/additionalFlightInformation/nameValue/@name flight/supplementalData/additionalFlightInformation/nameValue/@value
ICAO4thAdaptedField18_999d	flight/supplementalData/additionalFlightInformation/nameValue/@name flight/supplementalData/additionalFlightInformation/nameValue/@value
ICAO5thAdaptedField18_999e	flight/supplementalData/additionalFlightInformation/nameValue/@name flight/supplementalData/additionalFlightInformation/nameValue/@value
ICAO6thAdaptedField18_999f	flight/supplementalData/additionalFlightInformation/nameValue/@name flight/supplementalData/additionalFlightInformation/nameValue/@value
ICAO7thAdaptedField18_999g	flight/supplementalData/additionalFlightInformation/nameValue/@name flight/supplementalData/additionalFlightInformation/nameValue/@value
ICAO8thAdaptedField18_999h	flight/supplementalData/additionalFlightInformation/nameValue/@name flight/supplementalData/additionalFlightInformation/nameValue/@value

Simple Schema	FIXM 3.0 with U.S. Extension (Extension use marked in blue)
ICAO9thAdaptedField18_999i	flight/supplementalData/additionalFlightInformation/nameValue/@name flight/supplementalData/additionalFlightInformation/nameValue/@value
ICAO10thAdaptedField18_999j	flight/supplementalData/additionalFlightInformation/nameValue/@name flight/supplementalData/additionalFlightInformation/nameValue/@value
ICAO11thAdaptedField18_999k	flight/supplementalData/additionalFlightInformation/nameValue/@name flight/supplementalData/additionalFlightInformation/nameValue/@value
ICAO12thAdaptedField18_999l	flight/supplementalData/additionalFlightInformation/nameValue/@name flight/supplementalData/additionalFlightInformation/nameValue/@value
ICAO13thAdaptedField18_999m	flight/supplementalData/additionalFlightInformation/nameValue/@name flight/supplementalData/additionalFlightInformation/nameValue/@value
ICAO14thAdaptedField18_999n	flight/supplementalData/additionalFlightInformation/nameValue/@name flight/supplementalData/additionalFlightInformation/nameValue/@value
ICAO15thAdaptedField18_999o	flight/supplementalData/additionalFlightInformation/nameValue/@name flight/supplementalData/additionalFlightInformation/nameValue/@value
ICAO16thAdaptedField18_999p	flight/supplementalData/additionalFlightInformation/nameValue/@name flight/supplementalData/additionalFlightInformation/nameValue/@value
ICAO17thAdaptedField18_999q	flight/supplementalData/additionalFlightInformation/nameValue/@name flight/supplementalData/additionalFlightInformation/nameValue/@value
ICAO18thAdaptedField18_999r	flight/supplementalData/additionalFlightInformation/nameValue/@name flight/supplementalData/additionalFlightInformation/nameValue/@value
ICAO19thAdaptedField18_999s	flight/supplementalData/additionalFlightInformation/nameValue/@name flight/supplementalData/additionalFlightInformation/nameValue/@value
ICAO20thAdaptedField18_999t	flight/supplementalData/additionalFlightInformation/nameValue/@name flight/supplementalData/additionalFlightInformation/nameValue/@value
ICAO21stAdaptedField18_999u	flight/supplementalData/additionalFlightInformation/nameValue/@name flight/supplementalData/additionalFlightInformation/nameValue/@value
ICAO22ndAdaptedField18_999v	flight/supplementalData/additionalFlightInformation/nameValue/@name flight/supplementalData/additionalFlightInformation/nameValue/@value
ICAO23rdAdaptedField18_999w	flight/supplementalData/additionalFlightInformation/nameValue/@name flight/supplementalData/additionalFlightInformation/nameValue/@value
ICAO24thAdaptedField18_999x	flight/supplementalData/additionalFlightInformation/nameValue/@name flight/supplementalData/additionalFlightInformation/nameValue/@value
ICAO25thAdaptedField18_999y	flight/supplementalData/additionalFlightInformation/nameValue/@name flight/supplementalData/additionalFlightInformation/nameValue/@value
lastSeqNo_245a	Not Used
lastFltMsgRcvd_245b	Not Used
RNVArrival_925a	flight/aircraftDescription/accuracy/cmsFieldType flight/aircraftDescription/accuracy/cmsFieldType/@type flight/aircraftDescription/accuracy/cmsFieldType/@phase flight/aircraftDescription/accuracy/cmsFieldType/@uom

Simple Schema	FIXM 3.0 with U.S. Extension (Extension use marked in blue)
RNVEnroute_925b	flight/aircraftDescription/accuracy/cmsFieldType flight/aircraftDescription/accuracy/cmsFieldType/@type flight/aircraftDescription/accuracy/cmsFieldType/@phase flight/aircraftDescription/accuracy/cmsFieldType/@uom
RNVOceanic_925c	flight/aircraftDescription/accuracy/cmsFieldType flight/aircraftDescription/accuracy/cmsFieldType/@type flight/aircraftDescription/accuracy/cmsFieldType/@phase flight/aircraftDescription/accuracy/cmsFieldType/@uom
RNVDeparture_925d	flight/aircraftDescription/accuracy/cmsFieldType flight/aircraftDescription/accuracy/cmsFieldType/@type flight/aircraftDescription/accuracy/cmsFieldType/@phase flight/aircraftDescription/accuracy/cmsFieldType/@uom
RNVSpare1_925e	flight/aircraftDescription/accuracy/cmsFieldType flight/aircraftDescription/accuracy/cmsFieldType/@type flight/aircraftDescription/accuracy/cmsFieldType/@phase flight/aircraftDescription/accuracy/cmsFieldType/@uom
RNVSpare2_925f	flight/aircraftDescription/accuracy/cmsFieldType flight/aircraftDescription/accuracy/cmsFieldType/@type flight/aircraftDescription/accuracy/cmsFieldType/@phase flight/aircraftDescription/accuracy/cmsFieldType/@uom
tentativeFlightPlanIndicator_2459	Not Used
RNPArrival_925g	flight/aircraftDescription/accuracy/cmsFieldType flight/aircraftDescription/accuracy/cmsFieldType/@type flight/aircraftDescription/accuracy/cmsFieldType/@phase flight/aircraftDescription/accuracy/cmsFieldType/@uom
RNPEnroute_925h	flight/aircraftDescription/accuracy/cmsFieldType flight/aircraftDescription/accuracy/cmsFieldType/@type flight/aircraftDescription/accuracy/cmsFieldType/@phase flight/aircraftDescription/accuracy/cmsFieldType/@uom
RNPOceanic_925i	flight/aircraftDescription/accuracy/cmsFieldType flight/aircraftDescription/accuracy/cmsFieldType/@type flight/aircraftDescription/accuracy/cmsFieldType/@phase flight/aircraftDescription/accuracy/cmsFieldType/@uom
RNPDeparture_925j	flight/aircraftDescription/accuracy/cmsFieldType flight/aircraftDescription/accuracy/cmsFieldType/@type flight/aircraftDescription/accuracy/cmsFieldType/@phase flight/aircraftDescription/accuracy/cmsFieldType/@uom
RNPSpare1_925k	flight/aircraftDescription/accuracy/cmsFieldType flight/aircraftDescription/accuracy/cmsFieldType/@type flight/aircraftDescription/accuracy/cmsFieldType/@phase flight/aircraftDescription/accuracy/cmsFieldType/@uom

Simple Schema	FIXM 3.0 with U.S. Extension (Extension use marked in blue)
RNPSPare2_925l	flight/aircraftDescription/accuracy/cmsFieldType flight/aircraftDescription/accuracy/cmsFieldType/@type flight/aircraftDescription/accuracy/cmsFieldType/@phase flight/aircraftDescription/accuracy/cmsFieldType/@uom
reconReportedAlt_2460	flight/enRoute/position/altitude flight/enRoute/position/altitude/@uom
cancellationIndicator_92b	flight/departure/runwayPositionAndTime/runwayTime/controlled
ATCIntendedRoute_10c	flight/agreed/route/@atcIntendedRoute
flightPlanRouteRevNo_2468	Not Used
clearanceRoute_2469	Not Used
comNavApproachEquipICAO2012_910c	flight/aircraftDescription/capabilities/@standardCapabilities flight/aircraftDescription/capabilities/communication/communicationCode flight/aircraftDescription/capabilities/communication/dataLinkCode flight/aircraftDescription/capabilities/navigation/navigationCode
survEquipICAO2012_910d	flight/aircraftDescription/capabilities/surveillance/surveillanceCode

Appendix C: Mapping to AIXM Schema

This section provides details of how to map elements of SFDPS Simple Schema XML Flight message to AIXM 5.1 standard.

Three airspace utilization messages and two reconstitution messages processed by SFDPS are supported in AIXM format. For simplification, details regarding message source and header are omitted.

Route Status Information (HR)

The HR message is used to provide the status of adapted arrival and departure routes (i.e., whether a given route is active or inactive). It contains the route name and the route status (ON or OFF). It is received about once an hour.

The AIXM *RouteSegment* is used to represent this information.

The following table describes the fields of the HR message and their mapping to AIXM format within existing AIXM 5.1.

CMS Field Name	CMS Field ID	CMS Field Format	Example value	AIXM 5.1 (within "RouteSegment")	SFDPS Extension
				RouteSegmentTimeSliceType/aixm:interpretation Entry: "SNAPSHOT"	
Action Indicator	36a	Possible values: "ON" = active "OFF" = inactive	ON	<u>RouteAvailabilityType/status</u> Entry: "OPEN" (for "ON") "CLSD" (for "OFF")	
Route Status Elements	135a	2-6 alphanumerics route name	SD001	<u>RouteSegmentType/gml:name</u> Entry: "SD001"	

Adapted Route Status Reconstitution (DBRTRI)

This message from HADDs is a reconstitution version of the HR message. Content-wise, it is exactly the same as the HR message so the mapping defined for the HR message is utilized for this as well.

Sector Assignment Status Information (SH)

The SH message provides current sector assignment data for all adapted sectors in the ARTCC. It identifies the sector number as well as the fixed airspace volume (FAV) number if it exists. A single SH message can have multiple sector numbers defined, and each sector can have multiple FAV numbers defined. These messages occur roughly five per hour.

The AIXM mapping uses the *Airspace* feature with the type specified as “SECTOR”. An extension exists for defining multiple FAV numbers per sector as follows:

```
<complexType name="SectorAssignmentStatusExtensionType">
  <complexContent>
    <extension base="aixm:AbstractExtensionType">
      <sequence>
        <element name="FAVNumber" type="aixm:TextNameType" nillable="true" minOccurs="0"
maxOccurs="437"/>
      </sequence>
    </extension>
  </complexContent>
</complexType>
```

Each AIXM Airspace message represents a single sector, so therefore an SU message with multiple sectors will result in the creation of multiple AIXM Airspace messages.

The following table describes the fields of the SH message and their mapping to AIXM format either within existing AIXM 5.1 or within the extension created for SFDPS purposes.

CMS Field Name	CMS Field ID	CMS Field Format	Example value	AIXM 5.1 (within “Airspace”)	SFDPS Extension
				AirspaceTimeSliceType/ aixm:interpretation Entry: “SNAPSHOT”	
				AirspaceTimeSliceType/type Entry: “SECTOR”	
Sector Number	29a	2 digits	23	AirspaceTimeSliceType/designator Entry: e.g. “23”	
FAV or No FAV Indicator	29d 29c	4 digits dash	2405 -		SectorAssignmentStatus ExtensionType/FAVNum ber (Note: There may be up to 437 FAV numbers for each sector defined.) Entry: e.g. “2405” e.g. “-”

Sector Assignment Reconstitution (DBRTSI)

This message from HADDs is a reconstitution version of the SH message. Content-wise, it is exactly the same as the SH message, so it follows the mapping defined for the SH message.

Special Activities Airspace (SAA) Information (SU)

The SU message provides the status and schedules for the Special Activities Airspace (SAA). These messages occur roughly five per hour.

The AIXM mapping uses the *Airspace* feature with type specified as “R” (for “restricted”). An extension is made for defining SAA schedule information as shown below:

```
<complexType name="SAAScheduleExtensionType">
  <complexContent>
    <extension base="aixm:AbstractExtensionType">
      <sequence>
        <element name="ID" type="aixm:TextNameType" nillable="true" minOccurs="0"/>
        <element name="type" type="aixm:TextNameType" nillable="true" minOccurs="0"/>
        <element name="activationDateTime" type="aixm:TextNameType" nillable="true"
minOccurs="0"/>
        <element name="deactivationDateTime" type="aixm:TextNameType" nillable="true"
minOccurs="0"/>
      </sequence>
    </extension>
  </complexContent>
</complexType>
```

The following table describes the fields of the SU message and their mapping to AIXM format either within existing AIXM 5.1 or within the extension created for SFDPS purposes.

CMS Field Name	CMS Field ID	CMS Field Format	Example value	AIXM 5.1 (within “Airspace”)	SFDPS Extension
				AirspaceTimeSliceType/ aixm:interpretation Entry: “SNAPSHOT”	
				AirspaceTimeSliceType/type Entry: “R” (restricted)	
SAA ID	161a	1-10 alphanumerics	SHPT38ALPH A	<u>AirspaceTimeSliceType/</u> <u>designator</u> Entry: e.g. “SHPT38AL”	
SAA Activation Type	162a	“ON” or	ON	<u>AirspaceActivationType/status</u> Entry: “ACTIVE” (for “ON”)	

CMS Field Name	CMS Field ID	CMS Field Format	Example value	AIXM 5.1 (within "Airspace")	SFDPS Extension
		"OFF" or "SCHED"		"INACTIVE" (for "OFF") "AVBL_FOR_ACTIVATION" (for "SCHED")	
SAA Schedule Type	163a	"S" = scheduled "D" = deleted	S		SAAScheduleExtensionType/ type Entry: e.g. "S" e.g. "D"
SAA Schedule Activation Date and Time	164a	ddhhmm	302355		SAAScheduleExtensionType/ activationDateTime Entry: e.g. "302355"
SAA Schedule Deactivation Date and Time	164b	ddhhmm	310355		SAAScheduleExtensionType/ deactivationDateTime Entry: e.g. "310355"
SAA Low Altitude	165a	Contains the low altitude of the altitude range for the SAA. Valid low range is -2000 to 100000 feet.	5000	AirspaceVolumeType/ lowerLimit Entry: e.g. "5000"	
SAA High Altitude	165b	Contains the high altitude of the altitude range for the SAA. Valid low range is -2000 to 100000 feet.	30000	AirspaceVolumeType/ upperLimit Entry: e.g. "30000"	
SAA Schedule ID	166a	LLLddddddddd	SHP00000000 16		SAAScheduleExtensionType/ ID e.g. "0016"

Appendix D: SFDPS Connect Development Environment Details

Software Packages

Package Name	Description
gov.dot.faa.enroute.fdps.connect.app.SFDPSConnect	Main program for the SFDPS Connect application.
gov.dot.faa.enroute.fdps.connect.app.SFDPSConnect.gui	Creates and handles the SFDPS Connect GUI components.
gov.dot.faa.enroute.fdps.connect.app.SFDPSConnect.utils	Implements general utility methods and defines common types used by various classes specific to the SFDPS Connect application.
gov.dot.faa.enroute.fdps.connect.jms	Handles common JMS communications related functionality.
gov.dot.faa.enroute.fdps.connect.jms.active_mq	Handles ActiveMQ specific JMS communications related functionality. Receives and stores data onto a queue.
gov.dot.faa.enroute.fdps.connect.jms.solace	Handles Solace specific JMS communications related functionality. Receives and stores data onto a queue.
gov.dot.faa.enroute.fdps.connect.processor	Processes received messages. Keeps track of message statistics.
gov.dot.faa.enroute.fdps.connect.processor.jaxb.fixm.base	Generated JAXB code for processing FIXM XML format.
gov.dot.faa.enroute.fdps.connect.processor.jaxb.fixm.flight	Generated JAXB code for processing FIXM XML format.
gov.dot.faa.enroute.fdps.connect.processor.jaxb.fixm.foundation	Generated JAXB code for processing FIXM XML format.
gov.dot.faa.enroute.fdps.connect.processor.jaxb.fixm.nas	Generated JAXB code for processing FIXM XML format.
gov.dot.faa.enroute.fdps.connect.processor.jaxb.fixm.simple_xml	Generated JAXB code for processing Simple Schema XML format.
gov.dot.faa.enroute.fdps.connect.utils	Implements general utility methods and defines common types used by various classes.
gov.dot.faa.enroute.fdps.connect.web_services	Handles web services properties for SFDPS Connect, prepares, and utilizes generated web services packages to send requests.
gov.dot.faa.enroute.fdps.connect.web_services.wsdl.airspace_data_pub	Generated code for web service client. Performs web services SOAP request/response for airspace data.
gov.dot.faa.enroute.fdps.connect.web_services.wsdl.entities	Generated code for web service client. Implements fault, request, and response types for all four services.
gov.dot.faa.enroute.fdps.connect.web_services.wsdl.flight_data_pub	Generated code for web service client. Performs web services SOAP request/response for flight data.
gov.dot.faa.enroute.fdps.connect.web_services.wsdl.general_message_pub	Generated code for web service client. Performs web services SOAP request/response for general messages.
gov.dot.faa.enroute.fdps.connect.web_services.wsdl.operational_data_pub	Generated code for web service client. Performs web services SOAP request/response for operational data.

Source Code

SFDPS Connect Source Code:

All of these files are located within the *src* folder.

Package	File	Description
gov.dot.faa.enroute.fdps.connect.app.SFDPSConnect	package-info.java	Info file describing the package for the Javadoc.
gov.dot.faa.enroute.fdps.connect.app.SFDPSConnect	SFDPSConnect.java	Main program file for the SFPDS Connect application.
gov.dot.faa.enroute.fdps.connect.app.SFDPSConnect.gui	ActivityGraph.java	Implements the activity graphs in the GUI.
gov.dot.faa.enroute.fdps.connect.app.SFDPSConnect.gui	FlexibleLayout.java	Used to define the layout for the custom log4j appender, JTextAreaAppender.java.
gov.dot.faa.enroute.fdps.connect.app.SFDPSConnect.gui	GeneralStatisticsInformationType.java	Defines information to be reported in the general statistics portion of the GUI.
gov.dot.faa.enroute.fdps.connect.app.SFDPSConnect.gui	GUIConfiguration.java	Handles GUI configuration properties.
gov.dot.faa.enroute.fdps.connect.app.SFDPSConnect.gui	JTextAreaAppender.java	Custom log4j appender for displaying trace messages to the status console in the GUI.
gov.dot.faa.enroute.fdps.connect.app.SFDPSConnect.gui	MainDisplay.java	Implements the main GUI.
gov.dot.faa.enroute.fdps.connect.app.SFDPSConnect.gui	package-info.java	Info file describing the package for the Javadoc.
gov.dot.faa.enroute.fdps.connect.app.SFDPSConnect.gui	StatisticsDisplay.java	Implements the statistics display in the GUI.
gov.dot.faa.enroute.fdps.connect.app.SFDPSConnect.gui	StatisticsInformationField.java	Defines the statistics information fields for the GUI.
gov.dot.faa.enroute.fdps.connect.app.SFDPSConnect.gui	WebServiceRequestButton.java	Defines the web service request button and associated actions.
gov.dot.faa.enroute.fdps.connect.app.SFDPSConnect.utils	ExecutionModeSwitch.java	Defines the SFDPS Connect execution mode switches.
gov.dot.faa.enroute.fdps.connect.app.SFDPSConnect.utils	package-info.java	Info file describing the package for the Javadoc.
gov.dot.faa.enroute.fdps.connect.app.SFDPSConnect.utils	SFDPSConnectTools.java	Implements general utility methods used by various classes. Has specific functionality for the SFDPS Connect application.
gov.dot.faa.enroute.fdps.connect.jms	JMSClient.java	Defines common members and methods for JMS clients.
gov.dot.faa.enroute.fdps.connect.jms	JMSClientConfiguration.java	Handles common JMS client configuration properties.
gov.dot.faa.enroute.fdps.connect.jms	JMSPropertyType.java	Defines the JMS message property types used in SFDPS Connect.
gov.dot.faa.enroute.fdps.connect.jms	JMSTools.java	Implements custom utility methods associated with JMS.

Package	File	Description
gov.dot.faa.enroute.fdps.connect.jms	MessageQueue.java	Class defining queue to contain received SFDPS messages.
gov.dot.faa.enroute.fdps.connect.jms	package-info.java	Info file describing the package for the Javadoc.
gov.dot.faa.enroute.fdps.connect.jms.active_mq	JMSClientActiveMQ.java	Establishes and monitors ActiveMQ JMS connection for receiving data.
gov.dot.faa.enroute.fdps.connect.jms.active_mq	JMSClientActiveMQConfiguration.java	Handles ActiveMQ JMS client configuration properties.
gov.dot.faa.enroute.fdps.connect.jms.active_mq	package-info.java	Info file describing the package for the Javadoc.
gov.dot.faa.enroute.fdps.connect.jms.solace	JMSClientSolace.java	Establishes and monitors Solace JMS connection for receiving data.
gov.dot.faa.enroute.fdps.connect.jms.solace	JMSClientSolaceConfiguration.java	Handles Solace JMS client configuration properties.
gov.dot.faa.enroute.fdps.connect.jms.solace	package-info.java	Info file describing the package for the Javadoc.
gov.dot.faa.enroute.fdps.connect.processor	DataConditionType.java	Defines data condition.
gov.dot.faa.enroute.fdps.connect.processor	DataType.java	Defines data types.
gov.dot.faa.enroute.fdps.connect.processor	Measurement.java	Defines statistical measurements.
gov.dot.faa.enroute.fdps.connect.processor	MessageAnalyzer.java	Processes SFDPS messages.
gov.dot.faa.enroute.fdps.connect.processor	MessageMeasurement.java	Manages measurement data for a given message type.
gov.dot.faa.enroute.fdps.connect.processor	MessageType.java	Defines message types.
gov.dot.faa.enroute.fdps.connect.processor	package-info.java	Info file describing the package for the Javadoc.
gov.dot.faa.enroute.fdps.connect.processor	ProcessorConfiguration.java	Handles the processor configuration properties.
gov.dot.faa.enroute.fdps.connect.processor	SourceFacility.java	Defines the source facilities sending SFDPS data.
gov.dot.faa.enroute.fdps.connect.processor	SourceFacilityType.java	Defines SFDPS source facility types.
gov.dot.faa.enroute.fdps.connect.processor	Statistics.java	Handles statistical analysis and reporting of received messages.
gov.dot.faa.enroute.fdps.connect.utils	package-info.java	Info file describing the package for the Javadoc.
gov.dot.faa.enroute.fdps.connect.utils	Tools.java	Class defining utility methods used throughout the application.
gov.dot.faa.enroute.fdps.connect.web_services	package-info.java	Info file describing the package for the Javadoc.
gov.dot.faa.enroute.fdps.connect.web_services	WebServicesRequestConfiguration.java	Processes configuration properties for web services requests.
gov.dot.faa.enroute.fdps.connect.web_services	WebServicesRequestProcessor.java	Prepares and sends requests for all four services. Receives responses.
gov.dot.faa.enroute.fdps.connect.web_services	WebServicesRequestSwitch.java	Defines the web services request switches.

Package	File	Description
gov.dot.faa.enroute.fdpi.connect.web_services	WebServicesType.java	Defines the web service types.

Relevant Simple Schema XML JAXB Source Code:

The listed file contains classes used by the SFDPS Connect application to process Simple Schema XML format for received data.

Package	File	Description
gov.dot.faa.enroute.fdpi.connect.processor.jaxb.simple_schema	FDPSMsgs.java	Base Simple Schema XML message type.

Relevant FIXM JAXB Source Code:

The listed file contains classes used by the SFDPS Connect application to process FIXM XML format for received data.

Package	File	Description
gov.dot.faa.enroute.fdpi.connect.processor.jaxb.fixm.nas	NasFlightType.java	Base FIXM XML message type.

Relevant Web Service Client Source Code:

The listed files contain the web service client classes used by the SFDPS Connect application to perform web service requests.

Package	File	Description
gov.dot.faa.enroute.fdpi.connect.web_services.wsdl.airspace_data_pub	FdpiAirspaceSubscriptionPortTypeProxy.java	Used to obtain the subscription port type for airspace data service.
gov.dot.faa.enroute.fdpi.connect.web_services.wsdl.airspace_data_pub	FdpiAirspaceSubscriptionSOAPBindingStub.java	Used to perform airspace data request/response.
gov.dot.faa.enroute.fdpi.connect.web_services.wsdl.flight_data_pub	FdpiFlightSubscriptionPortTypeProxy.java	Used to obtain the subscription port type for flight data service.
gov.dot.faa.enroute.fdpi.connect.web_services.wsdl.flight_data_pub	FdpiFlightSubscriptionSOAPBindingStub.java	Used to perform flight data request/response.
gov.dot.faa.enroute.fdpi.connect.web_services.wsdl.general_message_pub	FdpiGeneralMessageSubscriptionPortTypeProxy.java	Used to obtain the subscription port type for general message service.
gov.dot.faa.enroute.fdpi.connect.web_services.wsdl.general_message_pub	FdpiGeneralMessageSubscriptionSOAPBindingStub.java	Used to perform general data request/response.

Package	File	Description
gov.dot.faa.enroute.fdps.connect.web_services.wsdl.operational_data_pub	FdpsOperationalSubscriptionPortTypeProxy.java	Used to obtain the subscription port type for operational data service.
gov.dot.faa.enroute.fdps.connect.web_services.wsdl.operational_data_pub	FdpsOperationalSubscriptionSOAPBindingStub.java	Used to perform operational data request/response.
gov.dot.faa.enroute.fdps.connect.web_services.wsdl.entities	FdpsAirdspaceDataSubscriptionRequestType.java	Defines airspace data request type.
gov.dot.faa.enroute.fdps.connect.web_services.wsdl.entities	FdpsAirdspaceDataSubscriptionResponseType.java	Defines airspace data response type.
gov.dot.faa.enroute.fdps.connect.web_services.wsdl.entities	FdpsFlightDataSubscriptionRequestType.java	Defines flight data request type.
gov.dot.faa.enroute.fdps.connect.web_services.wsdl.entities	FdpsFlightDataSubscriptionResponseType.java	Defines flight data response type.
gov.dot.faa.enroute.fdps.connect.web_services.wsdl.entities	FdpsGeneralMessagePublicationSubscriptionRequestType.java	Defines general message request type.
gov.dot.faa.enroute.fdps.connect.web_services.wsdl.entities	FdpsGeneralMessagePublicationSubscriptionResponseType.java	Defines general message response type.
gov.dot.faa.enroute.fdps.connect.web_services.wsdl.entities	FdpsOperationalDataSubscriptionRequestType.java	Defines operational data request type.
gov.dot.faa.enroute.fdps.connect.web_services.wsdl.entities	FdpsOperationalDataSubscriptionResponseType.java	Defines operational data response type.

Referenced Libraries (JAR files)

These JAR files are used to build the executable JARs for the SFDPS Connect application. They are not required to be present in the executable environment when running the application. The files are located in the *lib* folder.

Library	Description
activation.jar	Javabeans Activation Framework 1.1.1 Release (www.oracle.com/technetwork/articles/java/index-135046.html)
activemq-all-5.5.1-fuse-00-08.jar	Apache ActiveMQ 5.5.1. This is a requirement by the FAA/NEMS. (http://activemq.apache.org/ , and can also be obtained directly from the FAA.)
apache-log4j-extras-1.2.17.jar	log4j 1.2.17 (http://logging.apache.org/log4j/2.x/)
axis.jar	org.apache.axis_1.4.0.v201005080400 - Plug-In included with Eclipse IDE (plugins folder)
commons-discovery-0.2.jar	org.apache.commons.discovery_0.2.0.v201004190315 - Plug-In included with Eclipse IDE (plugins folder)
commons-lang-2.6.jar	Required for supporting Solace JMS functionality. (Specific Solace libraries compatible with NEMS are provided by the FAA.)
commons-lang3-3.4.jar	Commons Lang Version 3.4 - (http://commons.apache.org)
commons-logging-1.1.3.jar	Required for supporting Solace JMS functionality. (Specific Solace libraries compatible with NEMS are provided by the FAA.)
fdps-jaxb-1.3.0.jar	Required for JAXB generated code.
geronimo-jms_1.1_spec-1.1.1.jar	Required for supporting Solace JMS functionality. (Specific Solace libraries compatible with NEMS are provided by the FAA.)

Library	Description
javax.wsdl_1.6.2.v201012040545.jar	Plug-In included with Eclipse IDE (plugins folder)
jaxrpc.jar	javax.xml.rpc_1.1.0.v201209140446 - Plug-In included with Eclipse IDE (plugins folder)
jcommon-1.0.23.jar	JFreeChart 1.0.19 (www.jfree.org/jfreechart/)
jfreechart-1.0.19-experimental.jar	JFreeChart 1.0.19 (www.jfree.org/jfreechart/)
jfreechart-1.0.19.swt.jar	JFreeChart 1.0.19 (www.jfree.org/jfreechart/)
jfreechart-1.0.19.jar	JFreeChart 1.0.19 (www.jfree.org/jfreechart/)
junit-3.8.1.jar	JUnit library.
log4j-1.2.17.jar	Apache log4j 1.2.17 (http://logging.apache.org/log4j/2.x/)
mail.jar	JavaMail API 1.4.7 Release (www.oracle.com/technetwork/java/javamail/index.html)
saaj.jar	javax.xml.soap_1.2.0.v201005080501 - Plug-In included with Eclipse IDE (plugins folder)
slf4j-api-1.4.3.jar	Required for supporting Apache ActiveMQ 5.5.1. This is a requirement by the FAA/NEMS. (http://www.slf4j.org/ and can also be obtained directly from the FAA.)
slf4j-log4j12-1.4.3.jar	Required for supporting Apache ActiveMQ 5.5.1. This is a requirement by the FAA/NEMS. (http://www.slf4j.org/ and can also be obtained directly from the FAA.)
sol-common-7.1.1.169.jar	Required for supporting Solace JMS functionality. (Specific Solace libraries compatible with NEMS are provided by the FAA.)
sol-jcsmmp-7.1.1.169.jar	Required for supporting Solace JMS functionality. (Specific Solace libraries compatible with NEMS are provided by the FAA.)
sol-jms-7.1.1.169.jar	Required for supporting Solace JMS functionality. (Specific Solace libraries compatible with NEMS are provided by the FAA.)

Configuration Properties Files

These are the configuration properties files used by the SFDPS Connect application when run. The files are located within the *config* folder.

File	Description
request-airspace-data.properties	Property file template for airspace data request.
request-flight-data.properties	Property file template for flight data request.
request-general-message.properties	Property file template for general message request.
request-operational-data.properties	Property file template for operational data request.
sfdps-connect-pubSub.properties	Property file template for SFDPS Connect application running in Pub-Sub mode (GUI and non-GUI).
sfdps-connect-reqRes.properties	Property file template for SFDPS Connect application running in Request-Response mode.

Simple Schema XML Related Files

These files are used as part of the build process to generate JAXB objects for Simple Schema format. The Maven pom.xml is configured to utilize these files to generate the required code. The build process itself is automated. Changes to the Simple Schema format would result in one or both of these files being updated by FAA. The files are located within the *src/main/resources* folder.

File	Description
fdps.xsd	Simple Schema schema file.
fdps.xjb	Simple Schema bindings file for JAXB code generation.

Run Scripts

A script is written to run the SFDPS Connect in a Linux environment. The file is located in the *src/main/scripts* folder.

File	Description
start-sfdps-connect.sh	Script for starting the SFDPS Connect on Linux.

Appendix E: SFDPS Connect Properties Description

JMS Client Properties

Property Name	Description	Possible Values
INITIAL_CONTEXT_FACTORY	Initial context factory. This is a mandatory property.	provided by NEMS
CONNECTION_FACTORY	Connection factory. This is a mandatory field for Solace JMS client connection. For ActiveMQ JMS connection, this field is ignored.	provided by NEMS
VPN_NAME	VPN name. This is a mandatory field for Solace JMS client connection. For ActiveMQ JMS connection, this field is ignored.	provided by NEMS
COMPRESSION_LEVEL	Compression level. This is a mandatory field for Solace JMS client connection. For ActiveMQ JMS connection, this field is ignored.	Can be set from 0 to 9 but NEMS recommends setting this value to 6. Note: Setting to 0 disables compression and therefore disables Solace Pub-Sub. This is not recommended.
PROVIDER_URL	URL of the data provider. This is a mandatory property.	provided by NEMS
TOPIC_CENTER_NAME	Topic to connect to. This is a mandatory property.	provided by NEMS
SECURITY_PRINCIPAL	Username. This is a mandatory property.	provided by NEMS
SECURITY_CREDENTIALS	Password. This is a mandatory property.	provided by NEMS
RECEIVE_TIMEOUT_IN_MILLIS	Defines the timeout for the JMS message consumer in milliseconds. The message consumer waits to receive messages for the duration of time specified. If a message is not received during this time period, the consumer will stop waiting, assume there is a problem, and shutdown the JMS connection. In Pub-Sub mode, when not defined explicitly in the properties file, this value is set to a default of 120000 ms (2 minutes). After this time period, if no data is received, the application will shutdown and restart the connection to the JMS topic. In Req-Res mode, when not defined explicitly in the properties file, this value is set to 0. This will let the consumer know not to timeout when there is no	positive integer Default: 120000 (in Pub-Sub mode) 0 (in Req-Res mode)

	data received. In Req-Res mode, the receiving of data is dependent on when the user initiates a request, therefore it is reasonable to expect no data flow if the application is left idle. We do not want the consumer to timeout and the application to restart its connection in this situation.	
WAIT_TO_RECONNECT_TIME_IN_MILLIS	Time in milliseconds to wait before a reconnection attempt to JMS is made. When not defined explicitly in the properties file, the application will wait a default of 30000 ms (30 seconds) before attempting a JMS reconnection attempt.	positive integer Default: 30000
MESSAGE_QUEUE_SIZE	Defines the size of the queue to store received messages from the topic. The JMS client component of the software will place messages received from the JMS topic onto a queue for the message processing component, which takes messages off the queue as they are processed. If the number of messages on the queue reaches this limit, the queue will be emptied. This is to ensure more recent received messages are loaded onto the queue and the consumer does not cause the NEMS to backup. When not defined explicitly in the properties file, the size is set to a default of 500000.	positive integer Default: 500000

Processor Properties

Property Name	Description	Possible Values
LOG_PUB_SUB_MESSAGES_IN_MAIN_LOG	Sets whether or not to log accepted XML messages from Pub-Sub into the main data log file. This is a mandatory property.	true = log the messages false = do not log the messages

Property Name	Description	Possible Values
		Default: true (Pub-Sub modes) Default: false (Req-Res mode)
LOG_REPLY_MESSAGES_IN_MAIN_LOG	<p>Reply messages are a result of a SOAP request to web services. If the SFDPS Connect is connected to a topic where these messages are being sent to, they will be received by the SFDPS Connect and this property controls whether they should be included in the main data log file.</p> <p>This is a mandatory property.</p> <p>When set to true, it tells the application to log reply messages it receives into the main data log file.</p>	<p>true = log the messages</p> <p>false = do not log the messages</p> <p>Default: false (Pub-Sub modes)</p> <p>Default: false (Req-Res mode)</p>
RECONSTRUCT_TH_MESSAGES	<p>By default, SFDPS sends TH messages batched in Pub-Sub mode. The SFDPS Connect receives these in the batched format.</p> <p>SFDPS Connect will unbatch and reconstruct the individual TH messages if this property is defined and set to true.</p> <p>By default, SFDPS Connect will not reconstruct the TH messages from batched TH messages received.</p> <p>This property is not applicable to Req-Res mode as all TH messages sent in Req-Res mode are always unbatched.</p>	<p>true = reconstruct individual TH messages from batched TH messages received in Pub-Sub</p> <p>false = do not reconstruct TH messages from batched TH messages received in Pub-Sub</p> <p>Default: false (Pub-Sub mode, not relevant for Req-Res mode)</p>
REPLY_LOG_FOLDER_NAME	<p>Defines the folder where reply messages are to be logged when received.</p> <p>When a message is received, it will be logged into a single file represented by timestamp and subscription ID. The files resulting from a given request as represented by the unique subscription ID will be contained in a sub-folder under this defined folder.</p>	<p>alphanumeric characters, may contain underscore and dash</p> <p>Default: data-reply</p>

Property Name	Description	Possible Values
STATISTICS_LOG_FOLDER_NAME	Defines the folder where the statistics summary files are to be stored.	alphanumeric characters, may contain underscore and dash Default: stats
STATISTICS_LOG_FILE_NAME	Defines the name of the log file where statistics reports are logged. This property is mandatory. By default, statistics reports for the SFDPS Connect running in Pub-Sub mode are logged in files named "stats-pubSub". Statistics reports for the SFDPS Connect running in Req-Res mode are logged in files named "stats-reqRes". These files are created the "stats" folder. Periodically, the application will gather statistics and write the summary into files named <i>stats-pubSub.yyyyMMddHHmmssSSS.log</i> or <i>stats-reqRes.yyyyMMddHHmmssSSS.log</i>	alphanumeric characters, may contain underscore and dash Default: stats-pubSub (Pub-Sub modes) Default: stats-reqRes (Req-Res modes)
STATISTICS_LOG_START_TIME_IN_SEC	Defines when statistics report logging should start relative when the application was run. When not explicitly defined in the properties file, the time is set to a default of 30 seconds.	Default: 30 seconds
STATISTICS_LOG_TIME_INTERVAL_IN_SEC	Periodic time in seconds when statistics reports are to be logged. When not explicitly defined in the properties file, the time is set to a default of 60 seconds.	positive integer Default: 60 seconds

GUI Properties

Property Name	Description	Possible Values
CUSTOM_TITLE	Title to display in the GUI title bar. When not defined explicitly in the properties file, the default title is blank.	any combination of printable characters Default: blank
MAX_NUMBER_OF_LINES_IN_TEXT_DISPLAY	Number of lines to display in the GUI status panel before it is cleared.	positive integer Default: 5000

Property Name	Description	Possible Values
	When not defined explicitly in the properties file, the default of 5000 is defined.	
AIRSPACE_DATA_REQUEST_PROPERTIES_FILE	<p>Path and name of file containing airspace data request properties.</p> <p>When not defined explicitly in the properties file, the default <i>config/request-airspace-data.properties</i> is used.</p>	<p>any combination of valid characters for folder and file names</p> <p>Default: config/request-airspace-data.properties</p>
FLIGHT_DATA_REQUEST_PROPERTIES_FILE	<p>Path and name of file containing flight data request properties.</p> <p>When not defined explicitly in the properties file, the default <i>config/request-flight-data.properties</i> is used.</p>	<p>any combination of valid characters for folder and file names</p> <p>Default: config/request-flight-data.properties</p>
GENERAL_MESSAGE_REQUEST_PROPERTIES_FILE	<p>Path and name of file containing general message request properties.</p> <p>When not defined explicitly in the properties file, the default <i>config/request-general-message.properties</i> is used.</p>	<p>any combination of valid characters for folder and file names</p> <p>Default: config/request-general-message.properties</p>
OPERATIONAL_DATA_REQUEST_PROPERTIES_FILE	<p>Path and name of file containing general message request properties.</p> <p>When not defined explicitly in the properties file, the default <i>config/request-operational-data.properties</i> is used.</p>	<p>any combination of valid characters for folder and file names</p> <p>Default: config/request-operational-data.properties</p>

SOAP Web Services Request Properties

Property Name	Description	Possible Values
endpointN (where N = 0, 1, 2, ...)	The Service Endpoint tells the program where to send the request. Provided by NEMS. Used to configure NEMS connection. The number of endpoints defined depends on the number of services available for sending requests to.	http://provided_by_NEMS/FDPS/EnrouteAirspaceDataPublicationProxy
FdpsAirSpaceDataType	Type for Airspace data. Used to define Request for data.	Sector, Route or Altimeter
FdpsArrivalTimeEnd	The end of the time interval during which the flights arrived or are expected to arrive. In the format: YYYY-MM-DDThh:mm:ssZ Used to define Request for data.	2014-06-18T18:01:00Z
FdpsArrivalTimeStart	The start of the time interval during which the flights arrived or are expected to arrive. In the format: YYYY-MM-DDThh:mm:ssZ Used to define Request for data.	2014-06-18T18:01:00Z
FdpsDataFormat	The format selection for the flight data. Used to define Request for data.	FIXM or SIMPLEXML
FdpsDataState (this property is for Airspace data, see entry below for FdpsDataState for Flight data)	The state of the FDPS data being requested. CURRENT requires: <ul style="list-style-type: none"> - Set FdpsAirspaceDataType to Sector or Route. - Set FdpsMessageType to ALL. - Set FdpSourceFacility to specific ARTCCs or ALL. - Set FdpReportingStation to nil. - Set the FdpsReceivedTimeStart and FdpsReceivedTimeEnd to nil. HISTORICAL requires: <ul style="list-style-type: none"> - Set FdpsAirspaceDataType to Sector, Route or Altimeter. - Set FdpsMessageType to HA, HR, SU, SH, or ALL. These must agree with the data type: Sector (SH, SU), Route (HR), Altimeter (HA). - For Altimeter data set FdpsReportingStation to an airport name, otherwise set it to nil. - Set FdpsSourceFacility to specific ARTCCs or ALL. - Set the FdpsReceivedTimeStart and FdpsReceivedTimeEnd to bracket when SFDPS received the data. Used to define Request for data.	CURRENT - means data on the current state of sectors or routes. HISTORICAL - data received by SFDPS in a certain time range. SFDPS stores data for fifteen days.

Property Name	Description	Possible Values
FdpsDataState (this property is for Flight data, see entry above for FdpsDataState for Airspace data)	<p>The state of the FDPS data being requested.</p> <p>Requires reconfiguring of the following properties: FdpsMessageType, FdpsDataFormat, FdpsEnhancedData, SourceFacility, FdpsOriginAirport, FdpsDestinationAirport, FdpsFlightIdentifier, FdpsFlightOperator.</p> <p>CURRENT request requires:</p> <ul style="list-style-type: none"> - Departure and Arrival times set to nil - FdpsReceivedTimeStart and FdpsReceivedTimeEnd set to nil. <p>HISTORICAL request requires:</p> <ul style="list-style-type: none"> - Departure and Arrival times set to nil. - ReceivedTimeStart and ReceivedTimeEnd set to bracket when SFDPS received the data. <p>Used to define Request for data.</p>	<p>CURRENT - means the data pertains to only flights that are currently active or planned.</p> <p>HISTORICAL - means that the data, received by SFDPS within specified time, can represent all flights including active, planned and past flights that have landed or been cancelled. SFDPS stores data for fifteen days.</p>
FdpsDepartureTimeEnd	<p>The end of the time interval during which the flights departed or are expected to depart.</p> <p>In the format: YYYY-MM-DDThh:mm:ssZ</p> <p>Used to define Request for data.</p>	2014-06-18T18:01:00Z
FdpsDepartureTimeStart	<p>The start of the time interval during which the flights departed or are expected to depart.</p> <p>In the format: YYYY-MM-DDThh:mm:ssZ</p> <p>Used to define Request for data.</p>	2014-06-18T18:01:00Z
FdpsDestinationAirport	<p>Destination Airport for the flight.</p> <p>Used to define Request for data.</p>	Can be a single airport or a list of comma-separated airports or ALL
FdpsEnhancedData	<p>Indicator if data is from the authoritative source (Enhanced).</p> <p>Used to define Request for data.</p>	BASIC or ENHANCED
FdpsFlightIdentifier	<p>This is the call sign, that is, the flight identifier under which the flight is operating.</p> <p>Used to define Request for data.</p>	Can be a single flight ID or a list of comma-separated flight IDs or ALL
FdpsFlightOperator	<p>The FAA-approved three-letter organizational code under which the flight is operating. Applies only to the flight data service; applied only if the flight identifier contains a three-letter code.</p> <p>Used to define Request for data.</p>	Can be a single flight operator or a list of comma-separated operators or ALL

Property Name	Description	Possible Values
FdpsMessageType	Indicates the type of CMS message. Used to define Request for data.	For Airspace data: HR, HA, SU, SH, HR_AIXM, SH_AIXM, SU_AIXM or ALL For Flight data: FH, AH, HX, CL, DH, IH, HH, PH, HV, HU, ET, HP, NP, NI, NL, NU, TH, RH, LH, HZ, BA, RE, HF, HT, PT, OH, FH_FIXM, AH_FIXM, HX_FIXM, CL_FIXM, DH_FIXM, IH_FIXM, HH_FIXM, PH_FIXM, HV_FIXM, HU_FIXM, ET_FIXM, HP_FIXM, NP_FIXM, NI_FIXM, NL_FIXM, NU_FIXM, TH_FIXM, RH_FIXM, LH_FIXM, HZ_FIXM, BA_FIXM, RE_FIXM, HF_FIXM, HT_FIXM, PT_FIXM, OH_FIXM, For General Message data: GH For Operational data: AC, AK, SY or ALL For Status message: STATUS
FdpsOriginAirport	Origin Airport for the flight. Used to define Request for data.	Can be a single airport or a list of comma-separated airports or ALL
FdpsReceivedTimeEnd	Value to end a time interval for when SFDPS received data; in the format: YYYY-MM-DDThh:mm:ssZ Used to define Request for data.	2014-06-18T18:01:00Z or nil for a CURRENT request
FdpsReceivedTimeStart	Values to start a time interval for when SFDPS received data; in the format: YYYY-MM-DDThh:mm:ssZ Used to define Request for data.	2014-06-18T18:01:00Z or nil for a CURRENT request
FdpsReportingStation	The exact location for an Altimeter setting. It is usually an airport. Used to define Request for data.	Airport code or nil
FdpsRequestDestinationIdentifier	The Destination Identifier is the same as the username and tells NEMS where to send replies to.	Provided by NEMS

Property Name	Description	Possible Values
FdpsSourcefacility	The ARTCC which triggered the message. Used to define Request for data.	Center Code or ALL for all centers
FdpsSpecialFilters	Not used currently; for future development.	TBD
rounds	Number of times to cycle through all defined endpoints until connection to NEMS is established and a Web service request can be sent. The software will stop connection attempts when a connection is established and request is sent or when the number of rounds specified is reached.	1 to 50. If a value is not specified or is less than 1, the software will default to 1. If a value over 50 is entered, the software will default to 50.
timeoutinms	The timeout tells the program how long to wait for a response. Measured in milliseconds. Used to configure SFDPS Connect.	60000
username	User name supplied by NEMS.	provided by NEMS

Appendix F: Summary of SFDPS Connect Executable Modes

Execution Mode:	Pub-Sub (ActiveMQ)
Description:	Performs Pub-Sub functionality via ActiveMQ JMS connection, display real time statistics and activity, and log information.
Executable JAR:	SFDPSConnect.jar
Executable Component:	SFDPSConnect
Properties Files:	sfdps-connect-pubSub.properties
Run Command (Start Script):	start-sfdps-connect.sh -psa
Run Command (Java):	java -Xms512m -Xmx1024m -jar SFDPSConnect.jar -psa config/sfdps-connect-pubSub.properties

Execution Mode:	Pub-Sub (Solace)
Description:	Performs Pub-Sub functionality via Solace JMS connection, display real time statistics and activity, and log information.
Executable JAR:	SFDPSConnect.jar
Executable Component:	SFDPSConnect
Properties Files:	sfdps-connect-pubSub.properties
Run Command (Start Script):	start-sfdps-connect.sh -pss
Run Command (Java):	java -Xms512m -Xmx1024m -jar SFDPSConnect.jar -pss config/sfdps-connect-pubSub.properties

Execution Mode:	Pub-Sub (ActiveMQ, no GUI)
Description:	Performs Pub-Sub functionality via ActiveMQ JMS connection, display real time statistics and activity, and log information. No GUI run.
Executable JAR:	SFDPSConnect.jar
Executable Component:	SFDPSConnect
Properties Files:	sfdps-connect-pubSub.properties
Run Command (Start Script):	start-sfdps-connect.sh -psang
Run Command (Java):	java -Xms512m -Xmx1024m -jar SFDPSConnect.jar -psang config/sfdps-connect-pubSub.properties

Execution Mode:	Pub-Sub (Solace, no GUI)
Description:	Performs Pub-Sub functionality via Solace JMS connection, display real time statistics and activity, and log information. No GUI run.
Executable JAR:	SFDPSConnect.jar
Executable Component:	SFDPSConnect
Properties Files:	sfdps-connect-pubSub.properties
Run Command (Start Script):	start-sfdps-connect.sh -pssng
Run Command (Java):	java -Xms512m -Xmx1024m -jar SFDPSConnect.jar -pssng config/sfdps-connect-pubSub.properties

Execution Mode:	Request-Response (ActiveMQ)
Description:	Performs SOAP web services requests, receives responses from NEMS topic via ActiveMQ JMS connection, display real time statistics and activity, and log information.
Executable JAR:	SFDPSConnect.jar
Executable Component:	SFDPSConnect
Properties Files:	sfdps-connect-reqRes.properties request-airspace-data.properties

	request-flight-data.properties request-general-message.properties request-operational-data.properties
Run Command (Start Script):	start-sfdps-connect.sh -rra
Run Command (Java):	java -Xms512m -Xmx1024m -jar SFDPSConnect.jar -rra config/sfdps-connect-reqRes.properties

Execution Mode:	Request-Response (Solace)
Description:	Performs SOAP web services requests, receives responses from NEMS topic via Solace JMS connection, display real time statistics and activity, and log information.
Executable JAR:	SFDPSConnect.jar
Executable Component:	SFDPSConnect
Properties Files:	sfdps-connect-reqRes.properties request-airspace-data.properties request-flight-data.properties request-general-message.properties request-operational-data.properties
Run Command (Start Script):	start-sfdps-connect.sh -rrs
Run Command (Java):	java -Xms512m -Xmx1024m -jar SFDPSConnect.jar -rrs config/sfdps-connect-reqRes.properties